Service Manual

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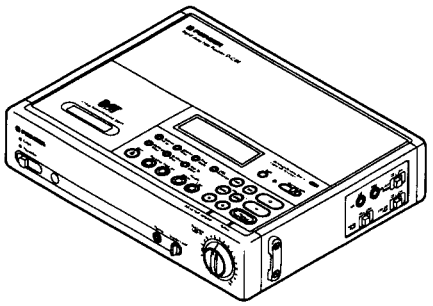

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DIGITAL AUDIO TAPE RECORDER

D-C88

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model	Power Requirement	The voltage can be converted by the following method.
	D-C88		
IEM	○	AC230V	AC120/100V, *

*: The power supply voltage selector switch is on the bottom surface of the accessory AC adaptor.

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CHAPTER 1

1.1 SPECIFICATIONS

Type ..... Rotating head digital audio tape recorder
Tape speed ..... 16.3 mm/s (HS),
8.15 mm/s (SP),
4.075 mm/s (LP)
Recording time ..... (use of a standard 120-min tape)
SP: Max. 120 min.
LP: Max. 240 min.
HS: Max. 60 min.
Number of channels ..... 2 channels, stereo
Number of quantization bits ..... 16 bits, linear
12 bits, nonlinear
Sampling frequencies ..... 48 kHz (recording, playback)
(SCMS provided) ..... 44.1 kHz (recording, playback)
32 kHz (recording, playback)
96 kHz (only analog recording/playback)
Error correction method ..... Double-encoded Reed-Solomon code
Modulation system ..... 8 – 10 conversion
Emphasis ..... Analog recording: Fixed to OFF
Playback: Automatic switching
Heads: ..... AT-construction Sendust heads
Recording/Playback frequency response ..... HS: 5 Hz to 44 kHz
SP: 5 Hz to 22 kHz
LP: 5 Hz to 14.5 kHz
Signal-to-Noise ratio ..... 90 dB or greater
Dynamic range ..... 92 dB or greater
Total harmonic distortion ..... 0.005% or less
Wow and flutter ..... Below measurable limits (± 0.001% W.PEAK)

- Unless otherwise listed, the output characteristics are the values for a sampling frequency of 48 kHz.

■ Analog Input/Output Terminals

Microphone input jack ..... Standard jack: 6 mm ϕ;
reference input level: 3 mV (input impedance: 10 kΩ)
Line input terminals ..... RCA PIN;
reference input level: 500 mV (input impedance: 50 kΩ)
Line output terminals ..... RCA PIN; reference output level: 500 mV
(output impedance: 1 kΩ)
Headphone output jack ..... Standard stereo jack: 6 mmϕ
(2.5 mW, load impedance: 8 Ω)

■ Digital Input/Output Terminals

Coaxial input terminal ..... RCA PIN; 0.5 Vp-p
(input impedance: 75 Ω)
Coaxial output terminal ..... RCA PIN; 0.5 Vp-p
(output impedance: 75 Ω)
Optical input terminal ..... x 1

■ Power Supply and Other Specifications

Power supply
AC adapter
Input ..... AC 230 V/120 V/100 V (switchable), 50/60 Hz
Output ..... DC ±11 V, +1200 mA, -400 mA
Battery pack ..... DC ±7.2 V, +1800 mAh, -1100 mAh
(Battery continuous use time:
About 2 hours in SP mode EIAJ recording/playback)
Power consumption ..... 20 W
(recording/playback using the AC adapter)
24 W (charging with the AC adapter)
External dimensions .... 300 (width) x 58 (height) x 230 (depth) mm
Unit weight ..... 2.7 kg (battery pack not included)

■ Accessory Functions

- Wide band mode (HS)
- Long play mode (LP)
- Legato link conversion (SP, LP modes)
- Skip title selection and music search
- Direct title selection
- Time skip
- Skip play
- Renumbering with TOC recording
- End mark recording, end search, blank search
- Auto ID recording, Q-code synchronized ID recording
- 7-mode counter
- Remaining tape display by automatic tape thickness calculation
- Digital peak margin display
- Recording after-monitoring
- Cue/Review (with fine cue/review)
- REC mute (automatic spacing)
- Automatic rewinding
- Operation key lock
- Microphone attenuator
- Microphone low-cut filter
- Automatic power-off (with battery pack use)
- Battery discharge indication (with battery pack use)
- Charge indication (with battery pack use)

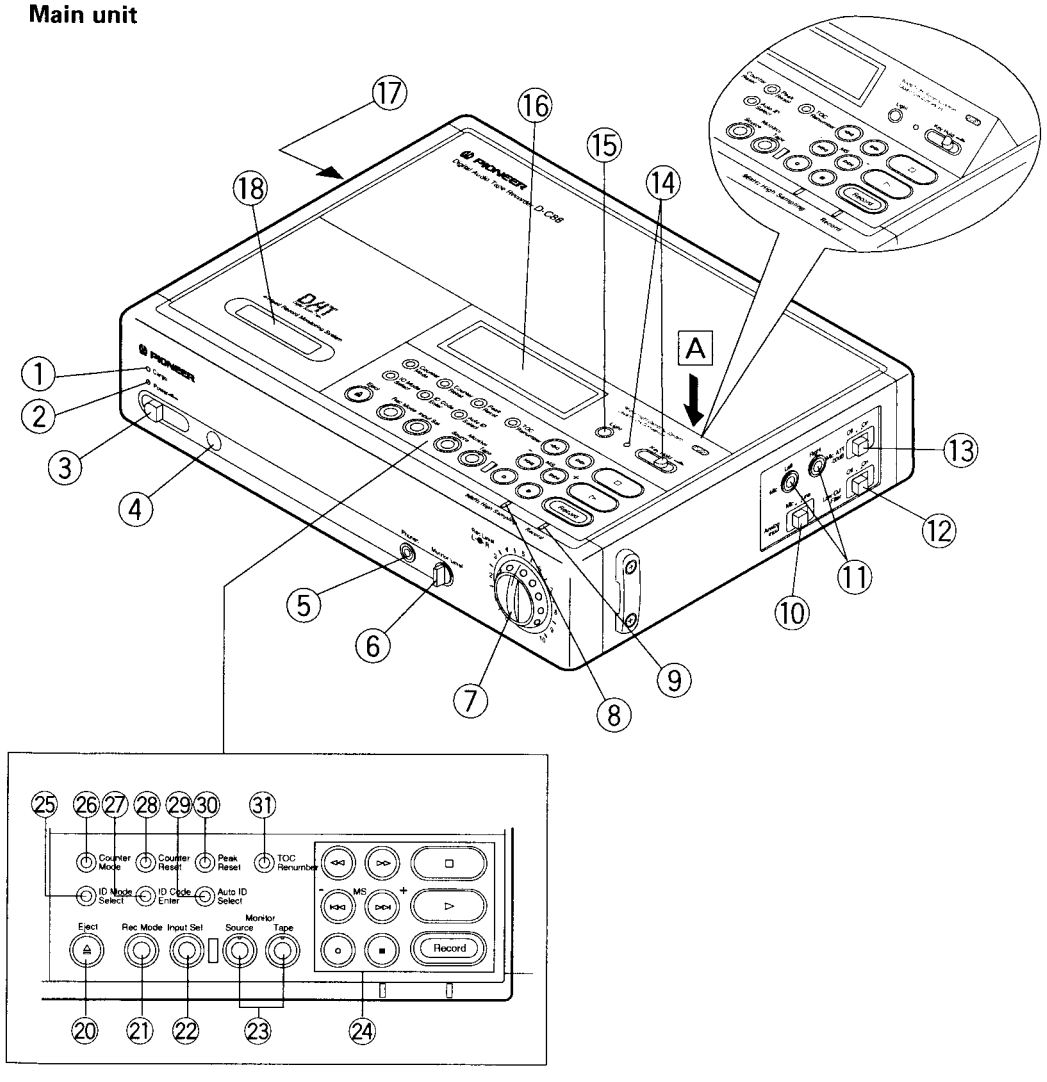
■ Accessories

Remote control unit 1
Remote control unit batteries (IEC R03) 2
Audio cords 2
AC adapter 1
Battery pack 1
Shoulder belt 1
Soft case 1
Operating instructions 1
Warranty card 1

NOTE:
The specifications and design of this product are subject to change without notice, due to improvement.

1.2 PANEL FACILITIES

Main unit



A When the (PUSH) part is pressed, the rear of the display panel is raised slightly. This can be grasped and pulled up by hand to an inclination of about 30°.

Main Unit

① Charge indicator (Charge)
When the AC adapter is connected while the accessory battery pack is inserted, and the power button of the main unit is switched off, charging of the battery pack will be started and the indicator will light up during charging. When charging has been completed, the indicator will start to flash.

② Power indicator (Power)
This lights when the power button is switched ON, and it goes out when the power button is switched OFF.

③ Power button (Power)
When this switch is slid in the direction of the arrow (left), the power is switched on, and when it is slid again in the same direction (left), the power is switched off.
When the unit has been in stop mode for about 6 minutes while the battery pack is being used, the power is switched off automatically (auto power OFF function).
The auto power OFF function can be cancelled.

④ Remote sensor window (SR)
This part receives the signals from the remote control. Operate the accessory remote control while it is pointed at this part.

⑤ Headphone jack (Phones)

⑥ Headphone level knob (Phones Level)
This is used to adjust the headphone volume.

⑦ Recording level knob (Rec Level L/R)
This is used to adjust the recording level at the time of analog signal input from a line source or a microphone. This is a double knob with the L channel on the outside and the R channel on the inside. The knob moves together, but individual operation is possible by holding one part and moving the other.

⑧ High sampling mode (96 kHz High Sampling)
This indicates HS mode (wide band mode) with a sampling frequency of 96 kHz.

⑨ Recording indicator (Record)
This indicates recording mode.

⑩ Microphone/Line selector switch (Analog Input Mic/Line)
This switches microphone input and line input.

⑪ Microphone jacks (Mic Left, Right)

⑫ Low cut filter switch (Low Cut Filter Off/On)
Set this switch to ON to avoid recording low frequencies like unwanted wind noise etc.

⑬ Microphone attenuator switch (Mic ATT Off/On)
This switch reduces the input sensitivity for the microphone. Set this switch to ON for recording loud sounds with the microphone.

⑭ Hold button/indicator (Key Hold)
When this button is slid in the direction of the arrow (to the right), the indicator lights and push buttons on the main unit will be made ineffective (remote control operation remains possible).
When the button is slid again in the same direction (to the right), the indicator goes out and push buttons will be made effective.

⑮ Light button (Light)
When this button is pressed, the display is lit, and when it is pressed again, the lighting goes out.

⑯ Display (page 1-6)

⑰ Battery pack compartment

⑱ Cassette holder

⑳ Eject button (Eject ⏏)
This button opens the cassette holder.

㉑ Recording mode button (Rec Mode)
This button selects the sampling frequency at the time of recording with analog input (microphone, line). Each time the button is pressed, the frequency changes as shown below.

→ 48kHz(SP) → 96kHz(HS) → 32kHz(LP) → 44.1kHz(SP) →

At the time of digital input (coaxial, optical), the sampling frequency at the time of recording is decided by the input signal.

㉒ Input selection button (Input Sel)
This button switches the input terminals for the recording source. Each time the button is pressed, switching is done as shown below.

→ LINE/MIC → COAX → OPT →

LINE/MIC is switched by the microphone/line input selector.

㉓ Recording monitor button/indicator (Monitor Source, Tape)
This button switches the output signal at the time of recording.
Source: The input signal is output.
Tape: The playback of the recorded signal is output.

㉔ Operation buttons

◄◄ : **Rewind button**
This rewinds the tape. When it is pressed during playback, review operation is executed.

►► : **Fast Forward button**
This fast forwards the tape. When it is pressed during playback, cue operation is executed.

■ : **Stop button**
This stops the tape.

I◄◄/MS–, ►►I/MS+: Title selection buttons
These are used for music search.

► : **Play button**
This plays the tape and starts recording (after operation of the recording button).

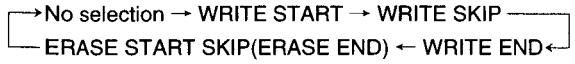
O : **Mute button**
This records a soundless section.

II : **Pause button**
This is used to pause the tape during recording or playback. The tape starts again when the button is pressed once more.
Pause cannot be executed during fast forward or rewinding.

Record: Recording button
Recording mode (recording standby) is entered when this button is pressed, and the indicator will light.
Press the play button or the pause button to start recording.

㉕ ID mode selection button (ID Mode select)

This is used for subcode editing. Each time the button is pressed, the mode changes as follows.



㉖ Counter mode button (Counter Mode)

This is used to switch the counter indication.

㉗ ID code enter button (ID Code Enter)

This is used for subcode editing. The mode selected with the ID mode selection button is executed.

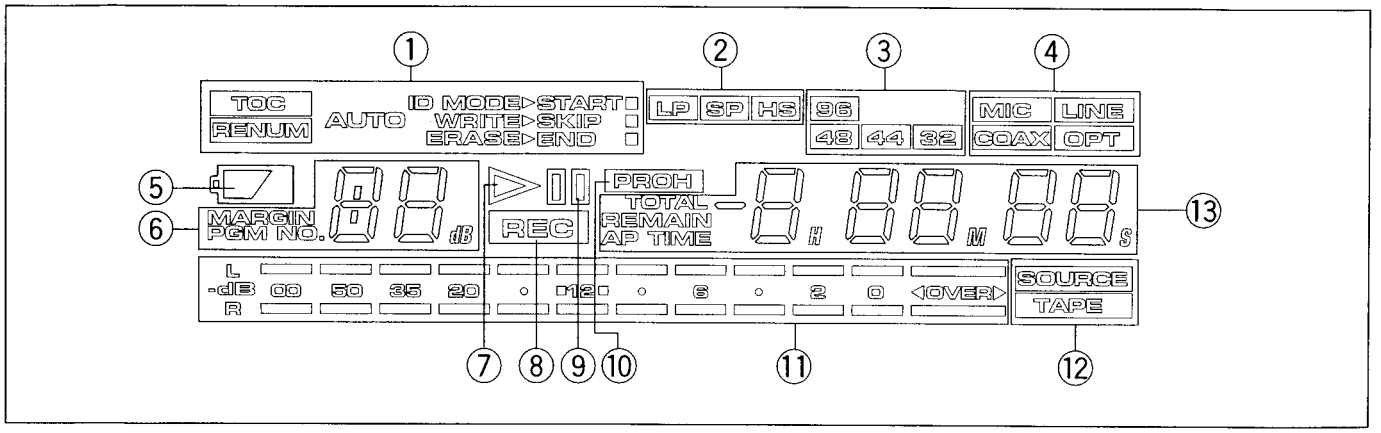
㉘ Counter reset button (Counter Reset)

When the counter mode is set to elapsed time (TIME COUNTER) mode and this button is pressed, the counter is reset to 0H 00M 00S.

㉙ Auto ID selection button (Auto ID Select)

At the time of recording: The start ID is recorded automatically.

At the time of playback: Skipping is done from the skip ID to the next start ID.



Display

① ID indicator

TOC : This indicates that the TOC has been read from the tape. This indicator flashes during TOC writing and reading.
RENUM : This indicates that renumbering is being done.
AUTO : This indicates that automatic ID recording at the time of recording and skip play at the time of playback is ON.
► : This indicates the selected ID type.
■ : This indicates ID detection.
WRITE: This indicates ID recording mode.
ERASE: This indicates ID erase mode.

② Tape run mode indicator

LP: Long play (long-play mode)
SP: Standard play (standard mode)
HS: High sampling (wide-band mode)

③ Sampling frequency indicator

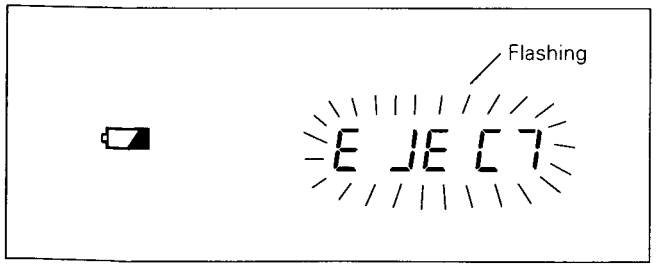
This indicates the present sampling frequency. It does not light up when the signal is interrupted at the time of digital input recording.

④ Input source indicator

MIC: Microphone jack input
LINE: Analog line input
COAX: Digital coaxial input
OPT: Digital optical input

⑤ Battery discharge indicator

This indicator starts to flash to notify that the battery is exhausted.Then the power supply will be automatically stopped after about 3 minutes of recording or playback have elapsed.
When power ON operation is executed again after power OFF, the display below will be shown, and only the eject operation will be possible.



⑥ Margin/Program No. indicator

MARGIN: This indicates peak margin display. When the input level is exceeded at the time of analog input, 00 dB flashes.
PGM NO: This indicates program No. display. "EE" is displayed when the read-out area is detected. "bb" is displayed for the read-in area.

⑦ Play indicator (►)

This indicates playback mode.

⑧ Recording indicator (REC)

This indicates recording mode.

⑨ Pause indicator (II)

This indicates a paused condition.

⑩ Recording prohibition indicator (PROH)

This lights when a recording prohibition signal (on the basis of SCMS) is given as input at the time of digital input recording (during standby or recording), at this time, the unit will enter recording standby status, and recording operation will become impossible.

⑪ Recording/Playback level meter

During recording, the input level peak value is indicated, and during playback and after-monitoring, the playback level is indicated.
OVER: This lights up with excessive input level of recording or excessive playback level of after-monitoring.

⑫ Monitor indicator

SOURCE: This indicates output of the input signal at the time of recording.
TAPE: This indicates playback output of the recorded signal at the time of recording.

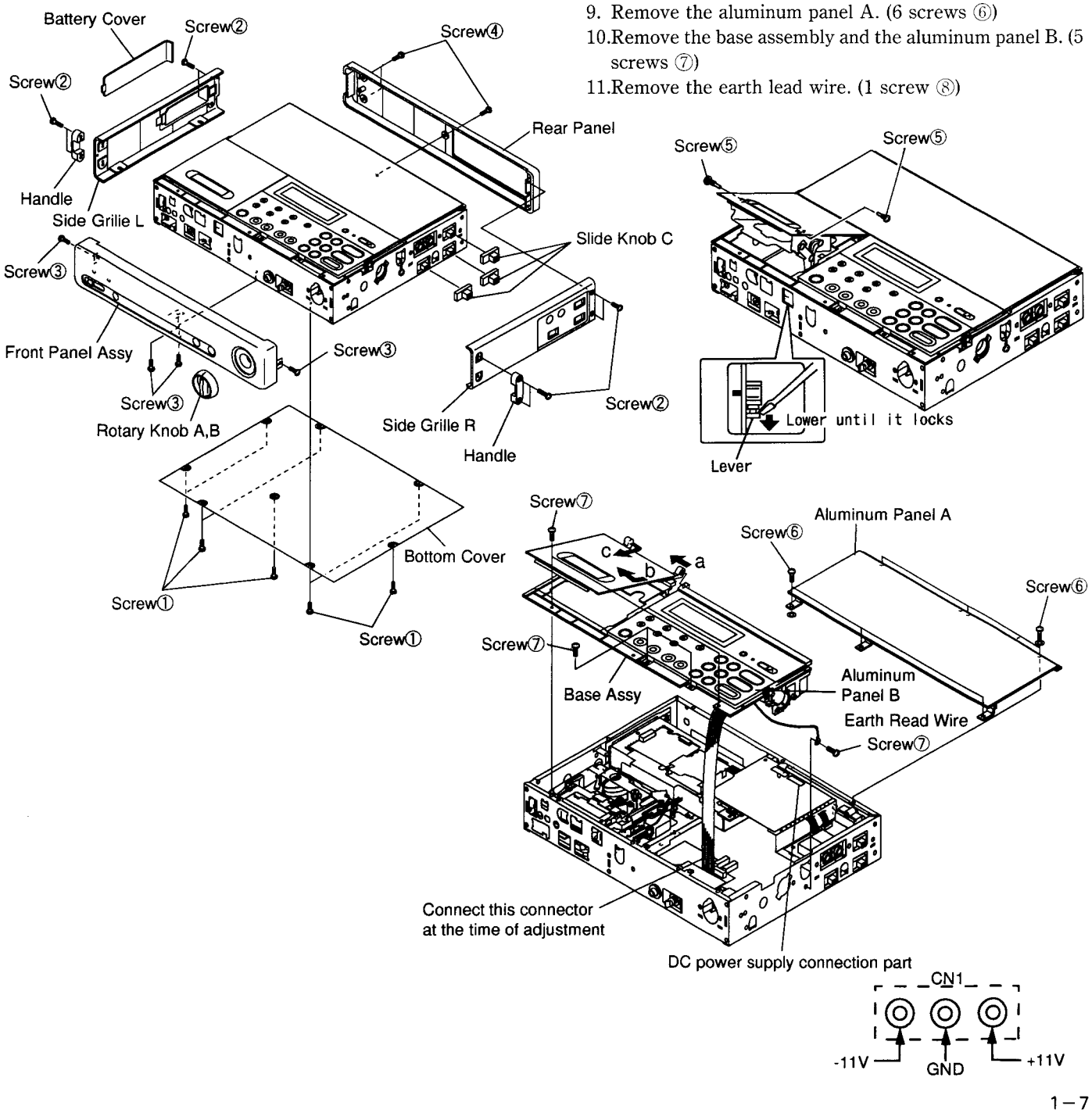
NOTE:
The SOURCE/TAPE indication of the indicator may change automatically according to the operation mode.

⑬ Counter display

1.3 DISASSEMBLY

● REMOVAL OF EXTERNALLY INSTALLED PARTS

1. Remove the bottom cover. (8 screws ①)
2. Remove the battery cover from the side grille L.
3. Remove side grille L and side grille R. (Screw ②, 4 each) (As these screws also fix the handle, the handle is removed together with the side grille.)
4. Remove the three slide knobs C.
5. Remove the rotary knobs A and B. Next, remove the front panel assembly. (4 screws ③)
6. Remove the rear panel. (3 screws ④)
7. Open the cassette door. (Insert a screwdriver or similar through the square hole at the right side of the mechanical unit as seen from the front, and lower the lever pushing the switch until it locks with a click.)
8. Remove the cassette door. (2 screws ⑤)
   After removal of the screws, push the hinge on the right side of the door to the inside to disengage it from its bearing (following figure a), pull it out about 10 mm to the front (following figure b), and then shift the left hinge to the inside to remove it from the bearing and remove the door (following figure c).
9. Remove the aluminum panel A. (6 screws ⑥)
10. Remove the base assembly and the aluminum panel B. (5 screws ⑦)
11. Remove the earth lead wire. (1 screw ⑧)

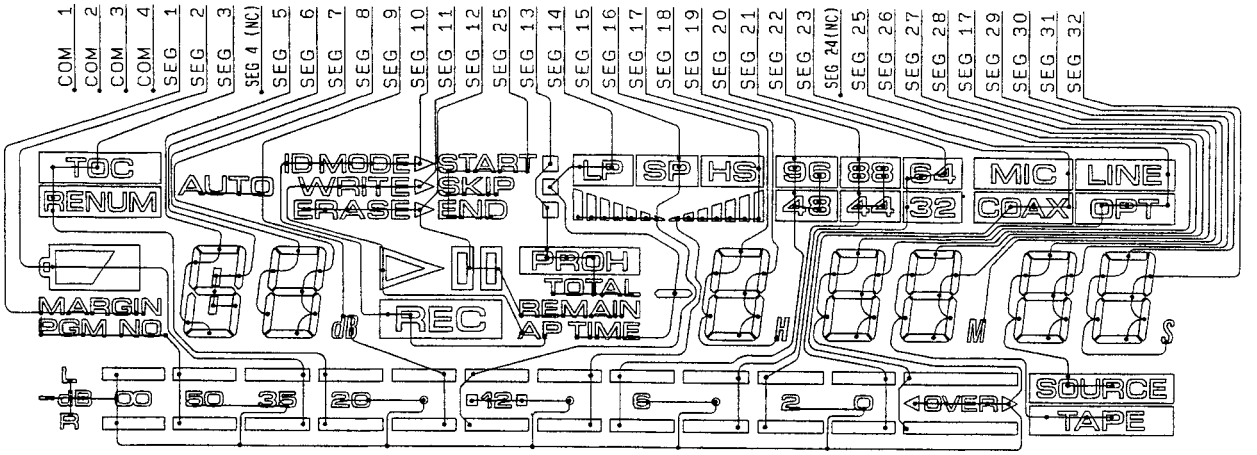


1.4 LCD INFORMATION

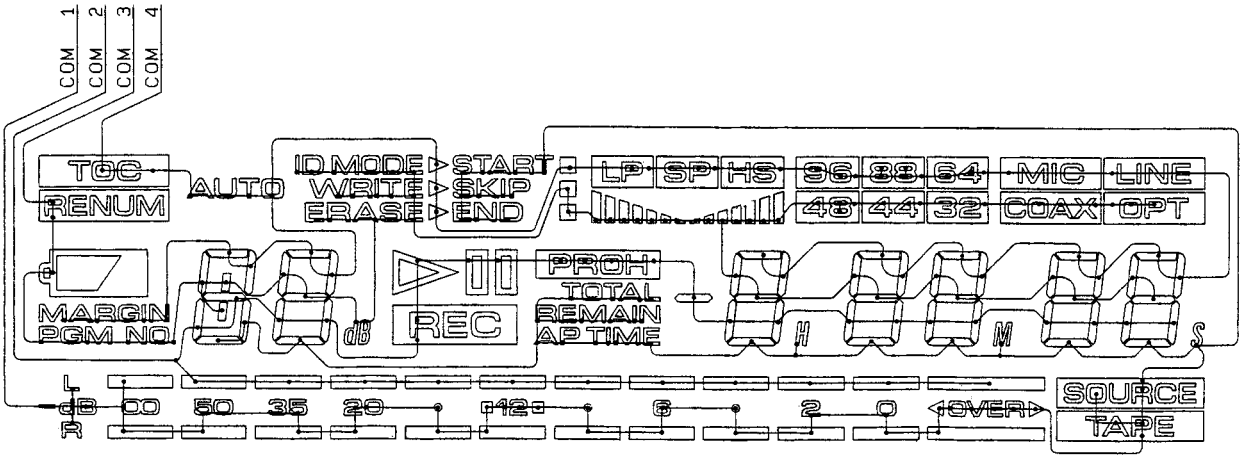
■ JAW1103 (V201 : DISPLAY UNIT)

● LCD

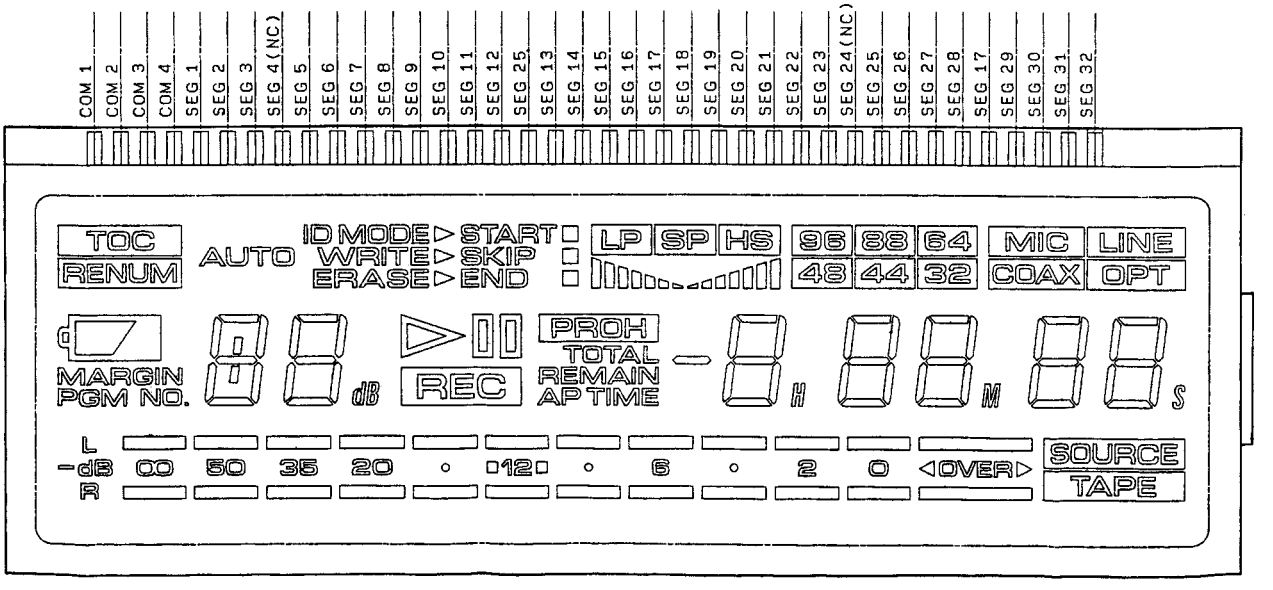
● Segment Assignment



● Common Assignment



● Pin Assignment and Pin Connection



1.5 IC INFORMATION

- *The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.*

■ PDG131A (IC512 : MOTHER UNIT)

● System Controller IC

● Pin Function

No.	Pin Name	I/O	Function	CPU
1	LPRUN	O	LP running mode monitor output terminal Connected to pin 44 of the gate array (PDB083A: IC517) and terminals A, B, C (pins 11, 10, 9) of the analog multiplexer (TC4053BF: IC602). Becomes "H" at the time of LP running mode (tape speed = 4.075 mm). ("L" at the time of SP, WSP, WLP running mode)	PF3
2	xMNTR	O	After monitor control output signal Connected to SEL (pin 1) of the input expansion IC (74HC157). Switching is executed between use of the signal of the master signal processing LSI (HD49226AFS: IC505) and use of the signal of the slave signal processing LSI (HD49226AFS: IC509). H: Master signal processing LSI, L: Slave signal processing LSI	PF4
3	CTRLS	O	Microcomputer data transfer mode input control signal/Microcomputer command control signal output (for slave signal processing LSI) Connected to the CTRL terminal (pin 2) of the slave signal processing LSI (HD49226AFS: IC509).	PF5
4	SELB	O	Input expansion IC input selection output terminal A Connected to the SELA pin (pin 14) of the input expansion IC (74HC153). By combination with SELB (pin 5), one of four 4-bit input combinations is selected.	PF6
5	SELA	O	Input expansion IC input selection output terminal B Connected to the SELB pin (pin 14) of the input expansion IC (74HC153). By combination with SELA (pin 5), one of four 4-bit input combinations is selected.	PF7
6	ADPD	O	A/D converter low power consumption mode control output terminal Connected to the PD pin (pin 10) of the A/D converter (AK5340: IC905). Under consideration of battery use, low power consumption mode is used when the A/D converter is not used. Low power consumption mode with "H".	PD0
7	LPMODE	O	LP mode selection output terminal Connected to the LP terminal (pin 60) of the master signal processing LSI (HD49226AFS: IC505) and the LP terminal (pin 60) of the slave signal processing LSI (HD49226AFS: IC509). The operation mode of both signal processing LSIs at the time of LP playback mode is selected. This becomes "H" at the time of WSP mode. (Half-speed playback is executed in WLP mode.) In LP, SP, and WSP mode it becomes "L". (In LP mode, double scan LP playback is executed, and in SP and WSP mode, the status if this terminal has no influence onto the operation.)	PD1
8	LVDATA	I	Level meter data input terminal Connected to 4Y (pin 12) of the input expansion IC (74HC157). By selection of xMNTR (pin 2), level meter data are given as input from the LVDATA terminal (pin 97) of the master signal processing LSI (HD49226AFS: IC505) or the slave signal processing LSI (HD49226AFS).	PD2
9	LVCK	O	Level meter data clock output terminal Connected to the LVCK terminal (pin 96) of the master signal processing LSI (HD49226AFS: IC505) and the LVCK terminal (pin 96) of the slave signal processing LSI (HD49226AFS: 1C509). As level meter reading is executed once every half frame, the shift clock is generated by 8 pulses each in the order of Lch and Rch. (Every frame in WSP mode.)	PD3

No.	Pin Name	I/O	Function	CPU
10	QDATA	I	CD Q data input terminal Connected to the QDATA terminal (pin 68) of the master signal processing LSI (HD49226AFS: IC505).	PD4
11	QDCK	O	CD Q data shift clock output terminal Connected to the QDCK terminal (pin 67) of the master signal processing LSI (HD49226AFS: IC505). The shift clock for reading the CD Q data for each frame is generated by 8 pulses each in the order of TNO and INDEX.	PD5
12	PBMUTE	O	Playback mute control output terminal Connected to the mute terminal (pin 1) of the master signal processing LSI (HD49226AFS: IC505) and the mute terminal (pin 1) of the slave signal processing LSI (HD49226AFS: IC509). Playback output signal muting (digital muting) ON/OFF control is executed. Muting ON with "H".	PD6
13	zSRVRST	O	Servo LSI reset output terminal Connected to the RESET terminal (pin 61) of the servo LSI (HD49228FS: IC601). The servo LSI is reset at the time of power ON/OFF and when switching from search mode to another mode.	PD7
14	Y1	I	Input terminal 1 of the input expansion IC output SELA = L, SELB = L: BRACK (drum brake control monitor) L, H: ENC0 (mechanism encoder output BIT0) H, L: PLLLOCK (DPLOCK monitor at the time of PLAY, PLLLOCK monitor at the time of high-speed search) H, H: xHALFIN (switch input for cassette half detection)	PC0
15	Y2	I	Input terminal 2 of the input expansion IC output SELA = L, SELB = L: ATFM (ATF monitor at the time of PLAY, HUNT monitor at the time of high-speed search) L, H: ENC1 (mechanism encoder output BIT1) H, L: DLOCK (drum lock monitor) H, H: RECINH (switch input for detection of the recording prohibition confirmation hole)	PC1
16	Y3	I	Input terminal 3 of the input expansion IC output SELA = L, SELB = L: ATFDET (ATFDET monitor at the time of PLAY, HOLD monitor at the time of high-speed search) L, H: ENC2 (mechanism encoder output BIT2) H, L: CRLOCK (capstan, reel lock monitor) H, H: xLDEND (switch input for cassette control loading end detection)	PC2
17	Y4	I	Input terminal 4 of the input expansion IC output SELA = L, SELB = L: PLTL (PILOT level status monitor) L, H: ENC3 (mechanism encoder output BIT3) H, L: RF (RF signal yes/no monitor) H, H: THIN (switch input for thin tape detection)	PC3
18	DMUTE	O	Double speed digital out control output signal Digital out prohibition with "H".	PC4
19	LMUTE	O	Line mute control output terminal Line muting (analog muting) ON/OFF is executed. Muting ON with "H".	PC5
20	TEST	O	Data strobe LSI test mode control output terminal Connected to the TEST terminal (pin 54) of the master data strobe LSI (HD49229: IC903) and the TEST terminal (pin 54) of the slave data strobe LSI (HD49229: IC903). Becomes "H" at the time of VCO free-run adjustment mode (at the time of test mode).	PC6

No.	Pin Name	I/O	Function	CPU
21	LVDATAM	I	Master signal processing LSI level meter data input terminal Connected to the LV DATA terminal (pin 97) of the master signal processing LSI (HD49226AFS: IC505). The level meter data are given as input. Only for the master signal processing LSI.	PC7
22	xSER	O	Master data strobe LSI search mode control output terminal Connected to the SEARCH terminal (pin 1) of the master data strobe LSI (HD49229: IC904). Becomes "L" in FF, REW, and other search running mode. At this time, the TEST terminal must be "L".	PH0
23	MODE1	O	RF amplifier operation mode switching output terminal 1 Connected to the MODE1 terminal (pin 42) of the master RF amplifier IC (HD12154MA: IC301) and pin 1 of the gate array (PDB083A: IC517). The AND output with RP (pin 25) is connected to the MODE1 terminal (pin 42) of the slave RF amplifier IC (HA12154MA: IC201). Control is executed for the second amplifier of the RF amplifier and the equalizer.	PH1
24	MODE2	O	RF amplifier operation mode switching output terminal 2 Connected to the MODE2 terminal (pin 41) of the slave RF amplifier IC (HA12154MA: IC201) and pin 2 of the gate array (PDB083A: IC517). Control is executed for the second amplifier of the RF amplifier and the equalizer.	PH2
25	RP	O	Master RF amplifier recording/playback mode switching output terminal The AND output of the RECPB terminal (pin 24) of the master signal processing LSI (HD49226AFS: IC505) is connected to the RECPB terminal (pin 39) of the master RF amplifier IC (HA12154MA: IC301). Master RF amplifier IC recording/playback mode switching is executed. The output from this microcomputer is for protection.	PH3
26	WSMODE	O	Audio block double speed switching output terminal Connected to the clock generation circuit and pin 3 of the master/slave switching timing generation IC (PDB083A: IC517). A/D, D/A block switching is executed according to the operation mode. This becomes "H" at the time of WSP, WLP mode.	PH4
27	xDARST	O	D/A converter reset output terminal This becomes "L" at the time of power ON, Fs, REC/PB switching.	PH5
28	OCSL	O	Digital input optical/coaxial selection output terminal H: Optical input L: Coaxial input	PH6
29	MLE	O	D/A converter mode set latch output terminal Connected to the LATCH terminal (pin 20) of PD2029A (IC906). The transfer data from the microcomputer are latched with the rising edge.	PH7
30	xRST	I/O	System reset terminal "L" level active	RST
31	EXTAL	I	Ceramic connection terminal (input) for system clock oscillation An 8.38 MHz ceramic oscillator is connected between this pin and pin 32.	EXTAL
32	XTAL	O	Ceramic connection terminal (output) for system clock oscillation	XTAL
33	VSS	–	GND terminal Connected to GND.	VSS
34	NC	O	Not used terminal	TX
35	NC	I	Not used terminal	TEX
36	AVSS	–	GND terminal of the A/D converter Connected to GND.	AVSS

No.	Pin Name	I/O	Function	CPU
37	AVREF	I	A/D converter reference voltage input terminal Connected to the 5 V line.	AVREF
38	xOPRST	O	Submicrocomputer reset output terminal Submicrocomputer (PDG130A: IC201) reset with "L". "L" output at the time of power ON and at the time of a communication error.	PA0/AN0
39	xOPREQ	O	Communication request output terminal to the submicrocomputer. Output of communication request signals to the submicrocomputer PDG130A (IC201).	PA1/AN1
40	xMDMHSP	O	Mode motor extreme high speed control output terminal Extreme high speed with "L". Used only at the time of EJECT.	PA2/AN2
41	AN3	I	Input terminal 1 for analog input expansion IC output Used as AN3 (analog input). AINSEL (74HC595 pin 2) = H: Battery minus side voltage monitor L: Battery plus side temperature monitor	PA3/AN3
42	AN4	I	Input terminal 2 for analog input expansion IC output Used as AN4 (analog input). AINSEL (74HC595 pin 2) = H: Battery plus side voltage monitor L: Battery minus side temperature monitor	PA4/AN4
43	AN5	I	Input terminal 3 for analog input expansion IC output Used as AN5 (analog input). AINSEL (74HC595 pin 2) = H: AC plus side voltage monitor L: AC minus side voltage monitor	PA5/AN5
44	TTOP	I	Input terminal of the tape top sensor output Used as AN6 (analog input).	PA6/AN6
45	TEND	I	Input terminal of the tape end sensor output Used as AN7 (analog input).	PA7/AN7
46	FGS	I	Supply side reel FG input terminal Used as interrupt terminal (CINT).	PB0/CS0
47	CTRLM	O	Microcomputer data transfer mode input control signal/Microcomputer command control signal output terminal (for master signal processing LSI) Connected to the CTRL terminal (pin 2) of the master signal processing LSI (HD49226AFS: IC505) and the CTRL terminal (pin 3) of the servo LSI (HD49228FS: IC601).	PB1/$\overline{CS0}$
48	CCK	O	Serial data transfer clock output terminal Used as SCK0 terminal. Connected to the shift clock input terminal of devices (master signal processing LSI, slave signal processing LSI, servo LSI, submicrocomputer, D/A converter) controlled by serial communication from the microcomputer. The shift clock cycle is 3.8 us, and the interval cycle is 61.1 us.	PB2/$\overline{SCK0}$
49	CDAO	O	Serial data input terminal (Matched to the terminal names on the signal processing LSI side. The data I/O direction is opposite to the terminal name.) Used as SI0 terminal. Connected to the serial data output terminal of devices (master signal processing LSI, slave signal processing LSI, submicrocomputer) controlled by serial communication from the microcomputer.	PB3/SI0
50	CDAI	O	Serial data output terminal (Matched to the terminal names on the signal processing LSI side. The data I/O direction is opposite to the terminal name.) Used as SO0 terminal. Connected to the serial data output terminal of devices (master signal processing LSI, slave signal processing LSI, submicrocomputer, D/A converter) controlled by serial communication from the microcomputer.	PB4/SO0

No.	Pin Name	I/O	Function	CPU
51	SCK1	O	Serial data transfer clock output terminal Used as SCK1 terminal. Connected to the SCK terminal (pin 11) of the output expansion IC (74HC595). The serial clock cycle is 1.91 us.	PB5/$\overline{SCK1}$
52	xTEST	I	Test mode input terminal Test mode with "L".	PB6/SO1
53	SDAO1	O	Serial data output terminal Used as SO1 terminal. Connected to the serial input terminal of the expansion IC (74HC595).	PB7/SO1
54	FSYNCM	I	Master frame sync signal input terminal Connected to the FSYNC terminal (pin 94) of the master signal processing LSI (HD49226AFS: IC505). This is a pulse signal with a duty of 50% and a cycle of 30 ms at the time of SP mode, 60 ms at the time of LP mode, and 15 ms at the time of WSP mode.	PE0/$\overline{EC0}$
55	FSYNCS	I	Slave frame sync signal input terminal Connected to the FSYNC terminal (pin 94) of the slave signal processing LSI (HD49226AFS: IC509). The cycles are the same as for FSYNCM, but the phase is normally 90x delayed. The same phase is obtained at the time of transient status and in digital input unlock status.	PE1$\overline{EC1}$
56	xMIC	I	Analog input switching switch input terminal H: Line input L: Microphone input	PE2/RMC
57	xPWSW	I	Input terminal for power switch detection Normally used as PE3 terminal. Power up is monitored in the main loop, and the power ON/OFF routine is started. Used as interrupt terminal (NMI) at the time of sleep mode (power OFF status with battery only). The power ON processing routine is started by an interrupt.	PE3/$\overline{NMI}$
58	PADJ	O	TACH adjustment voltage output terminal Used as PWM output terminal.	PE4/$\overline{PWM}$
59	xOUTCTL	O	Output expansion IC output enable control terminal Connected to the G terminal (pin 13) of the output expansion IC (74HC595). Output enable by "L".	PE5/T0/ADJ
60	xOPACK	I	Input terminal for permission of communication from the submicrocomputer Used as interrupt terminal (INT0).	PI0/INT0
61	CFG	I	Capstan FG input terminal The rising edge is monitored with timer interrupt processing every 1.95 ms, and this is used for capstan emergency check.	PI1/INT1
62	SWHM	I	Switching pulse input terminalUsed as interrupt terminal (INT2).	PI2/INT2
63	FGT	I	Take-up side reel FG input terminal Used as interrupt terminal (INT3).	PI3/INT3
64	x256	O	256/384Fs clock control output terminal Connected to the CMODE terminal (pin 12) of the A/D converter (AK5340: IC905), the C terminal (pin 17) of the D/A converter (PD2029A: IC906), and pin 43 of the master/slave switching generation IC (PDB083A: IC517). Becomes "H" at the time of Fs = 32 kHz mode. (Also becomes "H" at the time of WSP/WLP mode with Fs = 64 kHz.)	PI4

No.	Pin Name	I/O	Function	CPU
65	xDBCK	O	Master clock simultaneous oscillation selection control output terminal Simultaneous oscillation of the master clock at the time of Fs = 48/32 kHz and the master clock at the time of Fs = 44 kHz. Simultaneous oscillation with "L". Becomes "L" at the time of Fs switching and at the time of digital input unlock.	PI5
66	x4844PB	O	Master clock selection control output terminal Connected to the clock generation circuit and pin 42 of the master/slave switching generation IC (PDB083A: IC517). H: Master clock at the time of Fs = 44 kHz L: Master clock at the time of Fs = 48/32 kHz	PI6
67	DIN	O	Digital input recording sound mode monitor output terminal Becomes "H" at the time of digital input mode. Used for mute processing at the time of RX PLL unlock.	P17
68	BSOLON	O	Brake solenoid control output terminal Execution of brake solenoid ON/OFF control. Brake ON with "H".	PG0
69	xBSOLPWR	O	Brake solenoid power control output terminal Execution of brake solenoid power control. Becomes "L" when the brake starts to be applied. High power with "L".	PG1
70	EMP	O	Emphasis control output terminal Emphasis ON with "H".	PG2
71	OUTLAT	O	Output expansion IC outlatch output terminal Connected to the RCK terminal (pin 12) of the output expansion IC (74HC595). The transfer data from the microcomputer are latched with the rising edge.	PG3
72	VDD	–	Positive power supply terminal Connected to the 5 V line.	VDD
73	NC	–	Not used terminal	NC
74	xMDMCW	O	Mode motor CW direction control output terminal CW direction ON with "L".	PG4
75	xMDMCCW	O	Mode motor CCW direction control output terminal CCW direction ON with "L".	PG5
76	xMDMSPD	O	Mode motor speed control output terminal H: Low speed L: High speed	PG6
77	xTLED	O	Tape top/end sensor LED control output terminal LED ON/OFF control is executed for the tape top/end sensor. Flashes with a cycle of 3.9 ms.	PG7
78	CMCW	O	Capstan motor rotation direction control output terminal The rotation direction of the capstan motor is controlled. CW direction with "H".	PF0
79	xDMON	O	Drum motor control output terminal Drum motor ON/OFF control is executed. Drum motor ON with "L".	PF1
80	xCMON	O	Capstan motor control output terminal Capstan motor ON/OFF control is executed. Capstan motor ON with "L".	PF2

■ PDG130A (IC201 : DISPLAY UNIT)

● Sub System Controller IC

● Pin Function

No.	Pin Name	I/O	Function	CPU
1	SEG14	O	LCD segment signal output terminal 14	PG1/SEG18
2	SEG15	O	LCD segment signal output terminal 15	PG2/SEG17
3	SEG16	O	LCD segment signal output terminal 16	PG3/SEG16
4	SEG17	O	LCD segment signal output terminal 17	SEG15
5	SEG18	O	LCD segment signal output terminal 18	SEG14
6	SEG19	O	LCD segment signal output terminal 19	SEG13
7	SEG20	O	LCD segment signal output terminal 20	SEG12
8	SEG21	O	LCD segment signal output terminal 21	SEG11
9	SEG22	O	LCD segment signal output terminal 22	SEG10
10	SEG23	O	LCD segment signal output terminal 23	SEG9
11	NC	O	Not used	SEG8
12	SEG25	O	LCD segment signal output terminal 25	SEG7
13	SEG26	O	LCD segment signal output terminal 26	SEG6
14	SEG27	O	LCD segment signal output terminal 27	SEG5
15	SEG28	O	LCD segment signal output terminal 28	SEG4
16	SEG29	O	LCD segment signal output terminal 29	SEG3
17	SEG30	O	LCD segment signal output terminal 30	SEG2
18	SEG31	O	LCD segment signal output terminal 31	SEG1
19	SEG32	O	LCD segment signal output terminal 32	SEG0
20	COM1	O	LCD common signal output terminal 1	COM3
21	COM2	O	LCD common signal output terminal 2	COM2
22	COM3	O	LCD common signal output terminal 3	COM1
23	COM4	O	LCD common signal output terminal 4	COM0
24	VLC1	O	LCD bias power supply terminal 1	VLC1
25	VLC2	O	LCD bias power supply terminal 2	VLC2
26	VLC3	O	LCD bias power supply terminal 3	VLC3
27	VL	O	Cut-off control terminal for LCD	VL
28	RMSIG	I	Remote control signal input terminal The pulse cycle is measured automatically by the remote control reception circuit.	RMC

No.	Pin Name	I/O	Function	CPU
29	xOPREQ	I	Input terminal for communication request signals from the main microcomputer Connected to the PA1 terminal (pin 39) of the main microcomputer (PDG131A: IC512). The communication request signals from the main microcomputer are given as input by interrupt.	INT
30	XTAL	O	Ceramic output terminal for system clock oscillation	XTAL
31	EXTAL	I	Ceramic input terminal for system clock oscillation A 4.19 MHz ceramic oscillator is connected between this pin and pin 30.	EXTAL
32	xOPRST	I	System reset terminal Connected to the PA1 terminal (pin 38) of the main microcomputer (PDG131A: IC512). At the time of occurrence of a communication error, a reset signal is given as input from the main microcomputer.	$\overline{\text{RST}}$
33	NC	–	Not used terminal Connected to VDD.	NC
34	VD5	–	Power supply voltage terminal	VDD
35	KEY0	I	Key scan data input terminal 0 Used as A/D converter.	AD0/PI0
36	KEY1	I	Key scan data input terminal 1 Used as A/D converter.	AD1/PI1
37	KEY2	I	Key scan data input terminal 2 Used as A/D converter.	AD2/PI2
38	KEY3	I	Key scan data input terminal 3 Used as A/D converter.	AD3/PI3
39	KEY4	I	Key scan data input terminal 4 Used as A/D converter.	AD4/PB0
40	KEY5	I	Key scan data input terminal 5 Used as A/D converter.	AD5/PB1
41	NC	O	Not used terminal	AD6/PB2
42	NC	O	Not used terminal	AD7/PB3
43	NC	–	Not used terminal	NC
44	OPCK	I	Serial data transfer clock input terminal The clock for serial communication, put out by the main microcomputer, is given as input. The clock cycle is 3.818 fs.	PX0/$\overline{\text{SC}}$
45	OPDAO	O	Serial data output terminal Serial communication data are put out to the main microcomputer.	PX1/SO
46	OPDAI	I	Serial data input terminal Serial communication data are given as input from the main microcomputer.	PX2/SI
47	EROMCK	O	EEPROM control clock output terminal Connected to the CK terminal (pin 4) of the EEPROM (S-2914AIF10: IC202). The data transfer clock with the EEPROM is put out.	PA0
48	xSOULED	O	Output terminal for SOURCE LED lighting	PA1

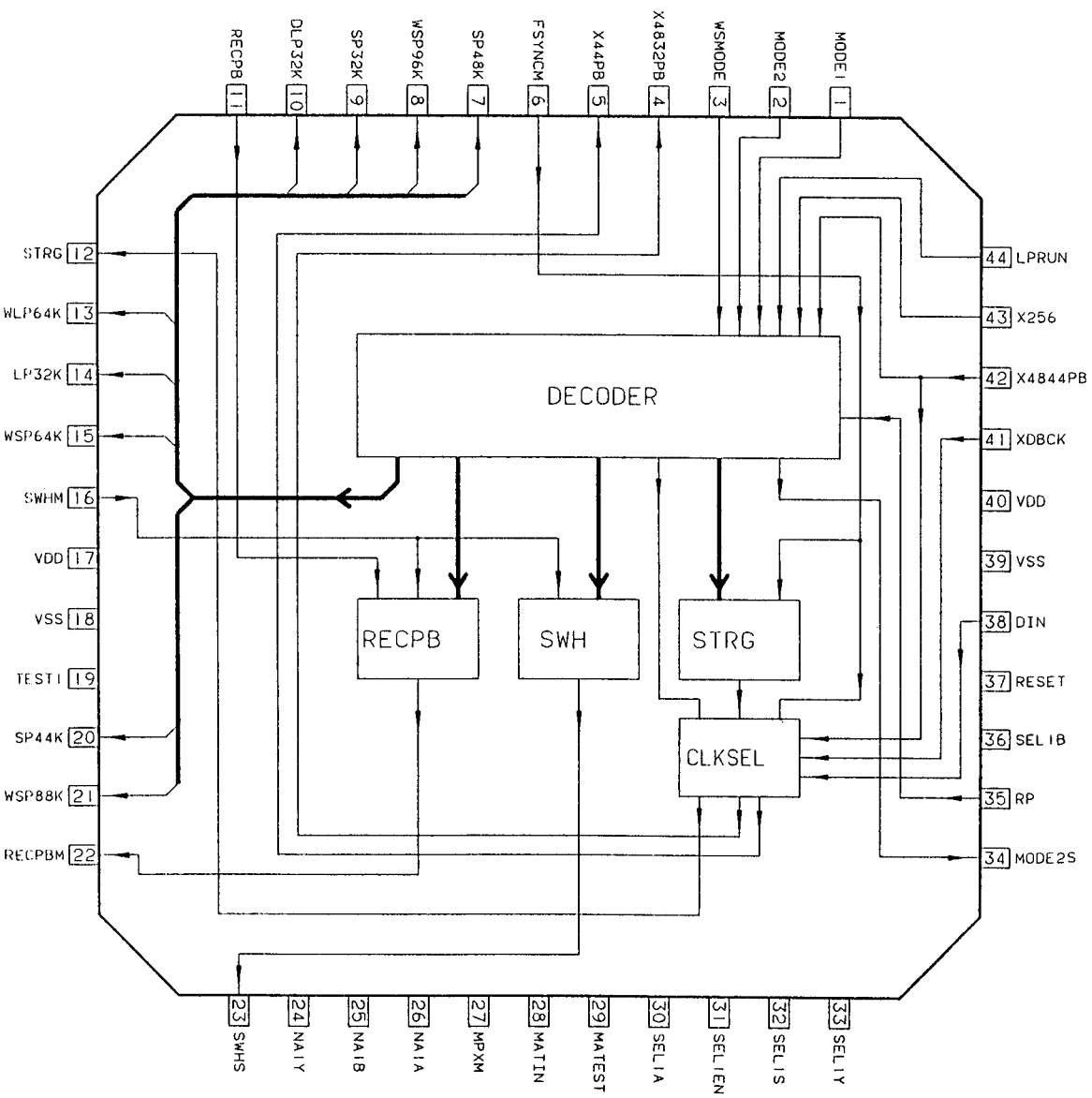
No.	Pin Name	I/O	Function	CPU
49	xTAPLED	O	Output terminal for TAPE LED lighting	PA2
50	x96KLED	O	Output terminal for 96K LED lighting	PA3
51	xREC LED	O	Output terminal for REC LED lighting	PF0
52	xHLD LED	O	Output terminal for KEY HOLD LED lighting	PF1
53	xLEDEL	O	Output terminal for EL LED lighting	PF2
54	NC	O	Not used terminal	PF3
55	EROMSO	O	EEPROM transfer data output terminal Connected to the DI terminal (pin 5) of the EEPROM (S-2914AIF10: IC202). Transfer data to the EEPROM are put out.	PE0
56	NC	O	Not used terminal	PE1
57	EROMCS	O	EEPROM chip selection signal output terminal Connected to the CS terminal (pin 3) of the EEPROM (S-2914AIF10: IC202).	PE2
58	NC	O	Not used terminal	PE3
59	xOPACK	O	Output terminal for the communication permission signal to the main microcomputer Connected to the INT0 terminal (pin 60) of the main microcomputer (PDG131A: IC512). Output of the communication permission signal to the main CPU.	PYO
60	NC	O	Not used terminal	PY1/$\overline{\text{PWM}}$
61	NC	I	Not used terminal Connected to VSS.	PY2/WP
62	EROMSI	I	EEPROM transfer data input terminal Connected to the DO terminal (pin 6) of the EEPROM (S-2914AIF10: IC202). The transfer data from the EEPROM are given as input.	PY3/$\overline{\text{EC}}$
63	SEG1	O	LCD segment signal output terminal 1	PD0/SEG31
64	SEG2	O	LCD segment signal output terminal 2	PD1/SEG30
65	SEG3	O	LCD segment signal output terminal 3	PD2/SEG29
66	NC	O	Not used terminal	PD3/SEG28
67	SEG5	O	LCD segment signal output terminal 5	PC0/SEG27
68	SEG6	O	LCD segment signal output terminal 6	PC1/SEG26
69	SEG7	O	LCD segment signal output terminal 7	PC2/SEG25
70	SEG8	O	LCD segment signal output terminal 8	PC3/SEG24
71	DG1	–	GND terminal	VSS
72	NC	O	Not used terminal	TX
73	NC	–	Not used terminal Connected to VDD.	NC
74	NC	I	Not used terminal Connected to VSS.	TEX

No.	Pin Name	I/O	Function	CPU
75	VD5	I	Reference voltage input terminal Connected to VDD.	VREF
76	SEG9	O	LCD segment signal output terminal 9	PH0/SEG23
77	SEG10	O	LCD segment signal output terminal 10	PH1/SEG22
78	SEG11	O	LCD segment signal output terminal 11	PH2/SEG21
79	SEG12	O	LCD segment signal output terminal 12	PH3/SEG20
80	SEG13	O	LCD segment signal output terminal 13	PG0/SEG19

■ PDB083A (IC517 : MOTHER UNIT)

● Master/Slave Switching IC

● Block Diagram



● Pin Function

No.	Pin Name	I/O	Function
1	MODE1	I	Operation mode setting input for STRG, SWHS, RECPBM generation circuit
2	MODE2	I	Control input for operation mode setting for STRG, SWHS, RECPBM generation circuit and MODE2S generation circuit
3	WSMODE	I	Operation mode setting input for STRG, SWHS, RECPBM generation circuit
4	X4832PB	O	24M system clock control signal output, clock oscillation at the time of X4832 = "L".
5	X44PB	O	22M system clock control signal output, clock oscillation at the time of X44 = "L".
6	FSYNCM	I	Trigger signal input for STRG generation
7	SP48K	O	Circuit-internal operation mode display output, "H" at the time of Fs = 48K, SP mode.
8	WSP96K	O	Circuit-internal operation mode display output, "H" at the time of Fs = 96K, WSP mode.
9	SP32K	O	Circuit-internal operation mode display output, "H" at the time of Fs = 32K, SP mode.
10	DLP32K	O	Circuit-internal operation mode display output, "H" at the time of Fs = 32K, double scan LP mode.
11	RECPB	I	Recording, play mode switching input
12	STRG	O	External sync control output of the DSP on the slave side. Set to "H" by the rise of FSYNCM, reset to "L" 90x from the drop of FSYNCM (1 cycle of FSYNCM = 360x).
13	WLP64K	O	Circuit-internal operation mode display output, "H" at the time of Fs = 64K, WLP mode.
14	LP32K	O	Circuit-internal operation mode display output, "H" at the time of Fs = 32K, half speed LP mode.
15	WSP64K	O	Circuit-internal operation mode display output, "H" at the time of Fs = 64K, WSP mode.
16	SWHM	I	Trigger signal input for SWHS, RECPBM generation
17	VDD	–	Power supply +5 V
18	VSS	–	GND
19	TEST1	I	Test control terminal, "L" at the time of normal operation.
20	SP44K	O	Circuit-internal operation mode display output, "H" at the time of Fs = 44K, SP mode.
21	WSP88K	O	Circuit-internal operation mode display output, "H" at the time of Fs = 88K, WSP mode.
22	RECPBM	O	RF circuit recording/play switching timing output, PLAY status: Always "L". REC status: "H" at the time of recording data recording, "L" at the time of after-monitoring data reading.
23	SWHS	O	Slave side A/B head switching output, output delayed 45x from SWHM (1 cycle of SWHM = 360x). "L" at the time of head A tracing, "H" at the time of head B tracing.
24	NA1Y	O	2 input NAND gate output
25	NA1B	I	2 input NAND gate input
26	NA1A	I	2 input NAND gate input
27	MPXM	I	Circuit-internal operation reference clock
28	MATIN	I	Test control terminal, "L" at the time of normal operation.

No.	Pin Name	I/O	Function
29	MATEST	I	Test control terminal, "L" at the time of normal operation.
30	SEL1A	I	Input for multiplexer with 2 to 1 enable
31	SEL1EN	I	Enable input for multiplexer with 2 to 1 enable
32	SEL1S	I	Selector input for multiplexer with 2 to 1 enable
33	SEL1Y	O	Output of multiplexer with 2 to 1 enable
34	MODE2S	O	Control output for slave-side RF circuit (data strobe IC, RF amplifier) MODE2 setting
35	RP	I	Control input for MODE2S generation circuit
36	SEL1B	I	Input for multiplexer with 2 to 1 enable
37	RESET	I	Reset input for STRG, SWHS, RECPBM generation circuit
38	DIN	I	Control input for X4832PB, X44PB generation circuit
39	VSS	–	GND
40	VDD	–	Power supply, +5 V
41	XDBCK	I	Control input for X4832PB, X44PB generation circuit
42	X4844PB	I	STRG, SWHS, RECPBM generation circuit operation mode setting and X4832PB, X44PB generation circuit control input
43	X256	I	Operation mode setting input for STRG, SWHS, RECPBM generation circuit
44	LPRUN	I	Operation mode setting input for STRG, SWHS, RECPBM generation circuit

■ LB1687M (IC609, IC610 : MOTHER UNIT)

● Motor Driver

● Truth Table

Item	Source sink	Input			Forward/reverse control F/RC
		U	V	W	
1	Phase W −» Phase V	H	H	L	L
	Phase V −» Phase W				H
2	Phase W −» Phase U	H	L	L	L
	Phase U −» Phase W				H
3	Phase V −» Phase W	L	L	H	L
	Phase W −» Phase V				H
4	Phase U −» Phase V	L	H	L	L
	Phase V −» Phase U				H
5	Phase V −» Phase U	H	L	H	L
	Phase U −» Phase V				H
6	Phase U −» Phase W	L	H	H	L
	Phase W −» Phase U				H

Input: "H": For each phase input 2, 1 is at a potential higher by 0.2 V or more.
: "L": For each phase input 2, 1 is at a potential lower by 0.2 V or more.
Forward/reverse control: "H": 2.0 to Vcc2
"L": 0 to 0.3 V

● Terminal functions

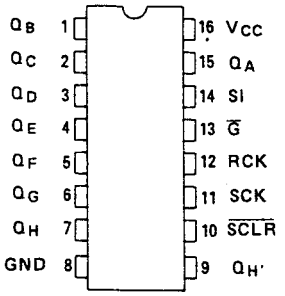
Terminal name	Pin No.	Function
UIN1, UIN2 VIN1, VIN2 WIN1, WIN2	25, 26 23, 24 21, 22	Phase U Hall element input terminal. Logic "H" is the status VIN1 » VIN2. Phase V Hall element input terminal. Logic "H" is the status VIN1 » VIN2. Phase W Hall element input terminal. Logic "H" is the status VIN1 » VIN2.
UOUT VOUT WOUT	4 5 6	Phase U output terminal Phase V output terminal Phase W output terminal
VCC1	3	Power supply terminal providing output
VCC2	8	Power supply terminal providing output to parts other than the output part. This voltage must be stabilized so that ripple, noise, etc. will not enter.
Rf	7	This is the output current detection terminal, and by insertion of Rf between this terminal and GND, the output current is detected as voltage. This terminal voltage is detected and the overcurrent protection circuit operates.
CD	19	This is the terminal for intake of the current (voltage) detected by Rf. By application of feedback from Rf, a small output control voltage gain can be obtained. Connected to GND when not used.
FC	27	Frequency characteristic correction terminal
VC	18	Speed-phase control terminal The control is a voltage control method with control of the output voltage.
VCREF	13	The control start voltage is decided by this terminal.
GND	28	GND other than output The minimum potential of the output transistor is Rf.
F/RC	20	Forward/reverse control terminal The truth value is changed and forward/reverse control is executed by making this terminal "H" (2 V or more)/"L" (0.3 V or less).
FGin−, FGin+	9, 10	FG signal input terminal
FGOUT	11	FG amplifier output terminal
CR	12	The Hall input gain can be changed by the voltage of this terminal. When a resistor and a capacitor are connected externally, the motor speed can be detected and the Hall input gain can be changed in two steps.

GENERAL PURPOSE LOGIC IC

■ 74HC595 (IC513 : MOTHER UNIT)

● 8 Bit Shift Register (3 State)

● Pin Assignment (Top View)



● Truth Table

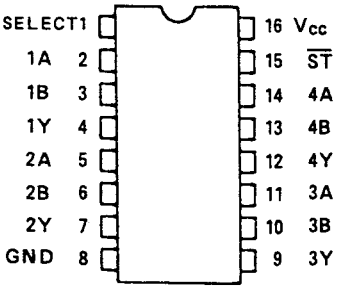
INPUTS					FUNCTION
SI	SCK	SCLR	RCK	G	
X	X	X	X	H	Output (QA, QH) disable
X	X	X	X	L	Output (QA, QH) enable
X	X	L	X	X	The shift register is cleared.
L	↑	H	X	X	The status of the first stage of the shift register is "L", the others store the data of the respective previous stage.
H	↑	H	X	X	The status of the first stage of the shift register is "H", the others store the data of the respective previous stage.
X	↓	H	X	X	The shift register does not change.
X	X	X	↑	X	The shift register data are stored in the storage register.
X	X	X	↓	X	The storage register does not change.

X:Don't Care

■ 74HC157 (IC503, IC508 : MOTHER UNIT)

● Quad 2ch Multiplexer

● Pin Assignment (Top View)



● Truth Table

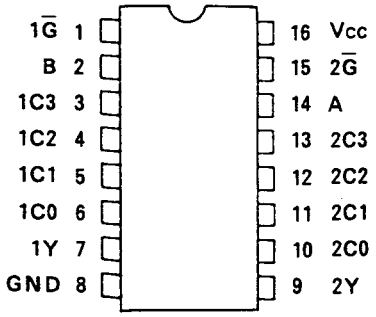
INPUTS				OUTPUTS	
ST	SELECT	A	B	Y(157A)	
H	X	X	X	L	
L	L	L	X	L	
L	L	H	X	H	
L	H	X	L	L	
L	H	X	H	H	

X : Don't Care

■ 74HC153 (IC511, IC514 : MOTHER UNIT)

● Dual 4ch Multiplexer

● Pin Assignment (Top View)



● Truth Table

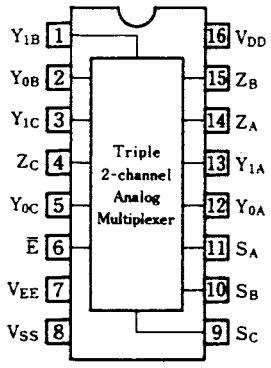
SELECT INPUTS		DATA INPUTS				STROBE	OUTPUT Y	
B	A	C0	C1	C2	C3	G	HC153A	
X	X	X	X	X	X	H	L	
L	L	L	X	X	X	L	L	
L	L	H	X	X	X	L	H	
L	H	X	L	X	X	L	L	
L	H	X	H	X	X	L	H	
H	L	X	X	L	X	L	L	
H	L	X	X	H	X	L	H	
H	H	X	X	X	L	L	L	
H	H	X	X	X	H	L	H	

X: Don't care
Z: High impedance

■ TC4053BF (IC602 : MOTHER UNIT、IC11 : POWER SUPPLY UNIT)

● **Triple 2ch Analog Maltiplexer**

● Pin Assignment (Top View)● Truth Table



Input		Channel ON
$\overline{E}$	S_A	
L	L	$Y_{0A}-Z_A$
L	H	$Y_{1A}-Z_A$
H	×	All OFF

■ IC information already listed in other service manuals

● **HD49228FS (IC601 : MOTHER UNIT)**
R−DAT1 chip digital • servo LSI ····· Refer to D−07 (ARP2823)

● **AK5340A−VS (IC905 : MOTHER UNIT)**
A/D converter ····· Refer to D−05 (RRV1201)

● **HD49229 (IC903, IC904 : MOTHER UNIT)**
Data strobe IC ····· Refer to D−07 (ARP2823)

● **HD49226AFS (IC505, IC509 : MOTHER UNIT)**
R−DAT 1 chip signal processing LSI ····· Refer to D−07 (ARP2823)

● **HA12154MA (IC301, IC351 : RF UNIT)**
RF redording playback AMP ····· Refer to D−07 (ARP2823)

1.6 ADJUSTMENTS

■ Supply voltage

Use a stabilized power supply and supply DC voltage between +11 V/GND and −11 V/GND at DC IN at the rear of the main unit and at CN1 (3-terminal connector) of the power supply unit (refer to page 1-7).

■ Adjustment Conditions

1. Clean the head and tape transit surfaces (tape guide, drum, capstan shaft, and pinch roller).
2. Before making adjustments, warm up the set for a few minutes.
3. Use an oscilloscope with a 10 : 1 probe.

● Test Tapes

Tracking tape : SDA−101 (TY−7251)
Level tape : SDA−102 (TY−7111)
Torque meter FWD : SDA−104 (TY−7131)
Blank tape : SDA−301
SDA−302
(TY−30B)
Error-rate adjustment tape : SDA−111 (SP)
SDA−112 (WSP)

■ Adjustment Items

Mechanical system

1. Back Tension Torque Adjustment
2. Tape Pass Confirmation
3. Tape Pass Adjustment

Electrical system

1. PLL Adjustment
2. TACH Adjustment
3. ATF Recording Current Adjustment
4. Error Rate Adjustment

■ SETTING THE TEST MODE

● 1.5 TP Test Mode

1. Short-circuit the connectors CN30−8 (XTEST) and CN30−1 (GNDA) of the MOTHER unit. At this time, "PGM NO" on the LCD flashes.
2. Press the counter reset key (C−Reset). At this time, confirm that the counter display part of the LCD becomes "PHASE". (TACH adjustment mode)

● Test mode cancellation

Open the XTEST terminal to cancel this test mode.

● 2/3 waveform setting method

1. Enter into 1.5TP test mode.
2. Connect a stabilized power supply between CN30−7 (VOFT) and CN30−1 (GNDA) and apply +2.5 V.
3. Play back the tracking tape (SDA−101) and execute fine adjustment of the stabilized power supply (around +2.5 V) so that the level close to the center of the RF waveform (Ach) becomes a maximum.
4. Execute fine adjustment of the stabilized power supply voltage so that the level close to the center of the RF waveform (Ach) becomes about 2/3 of the level in item 3. (Around +2.0 V).

● Test Mode for Recording Current Adjustment

1. Short-circuit the connectors CN30−8 (XTEST) and CN30−1 (GNDA) of the MOTHER unit. At this time, "PGM NO" on the LCD flashes.
2. Press the counter mode key (C−Mode). At this time, confirm that the PGM NO display part of the LCD becomes "db".

● Test mode cancellation

Open the XTEST terminal to cancel this test mode.

Note:
At the time of exchange of the memory IC (IC202), TACH adjustment must be executed after initialization of the memory IC in initialization mode.

● Initialization mode

1. Short-circuit the connectors CN30−8 (XTEST) and CN30−1 (GNDA) of the MOTHER unit. At this time, "PGM NO" on the LCD flashes.
2. Press the ID mode key (ID−Mode select).

■ MECHANICAL SYSTEM ADJUSTMENT

1. Back Tension Torque Adjustment

- Purpose : To stabilize the tape's contact with the rotating drum.
- Symptoms of Improper Adjustment : Small torque ⇨ Tape transit is unstable.
  Large torque ⇨ Tape or head is damaged.

Measuring Device/Jig	Measuring Device Connection	DAT State	Part to be Adjusted
● Torque Meter FWD : SDA−104 (TW−7131)		● PLAY mode	● Spring hook part on the reel base

Adjustment Procedure

Preparation

- Mount the torque meter (SDA−104).

1. Press the PLAY key and confirm that the center of the back tension torque value on the torque meter FWD is between 6.5 to 9.5g • cm.
2. If the value is not within this standard, adjust positions A to C on the reel base spring hook part.

Adjustment Diagram

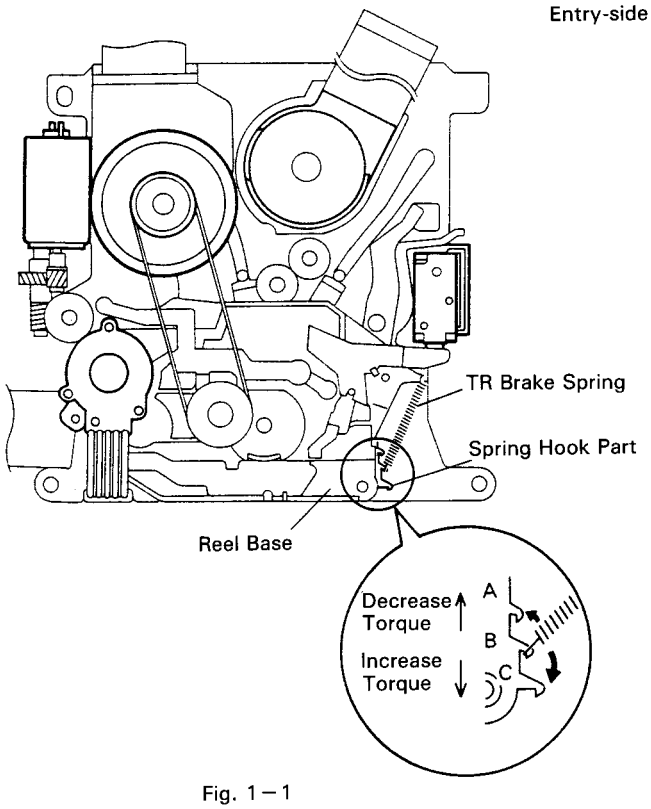


Fig. 1−1

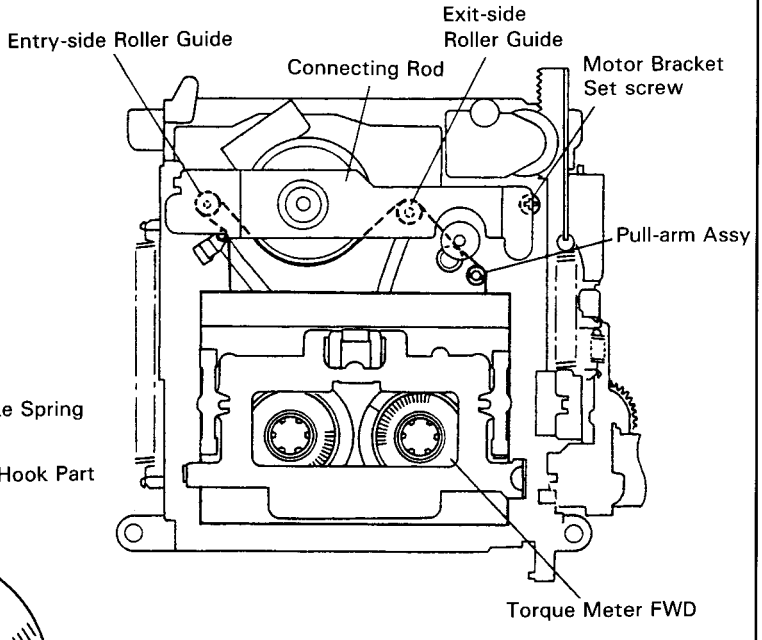


Fig. 1−2

2. Tape Pass Confirmation

- Purpose : To confirm that the tape is correctly aligned with the drum assembly lead. (Tape transit adjustment)
- Symptoms of Improper Adjustment : Sound is interrupted, noise is generated, or sound quality is poor.

Measuring Device/Jig	Measuring Device Connection	DAT State	Part to be Adjusted
● Oscilloscope ● Test Tape : Tracking/ SDA−101 (TY−7251)	● Oscilloscope MAIN unit interior : CH1 : Between ENV (CN30−4) and GND A (CN30−1) CH2 : Between HSWP (CN30−6) and GND A (CN30−1)	● PLAY mode (Test mode)	● Waveform check

Adjustment Procedure

Preparation

- Mount the tracking tape (SDA−101).
- After setting the 1.5 TP test mode, produce the 2/3 waveform and play the tape. (Refer to Page 1−24.)

1. Check the waveform at this time on the oscilloscope and make sure that the degree of flatness is at least 75%.

2. If the degree of flatness is less than 75%, perform the procedures described in "3. Tape Pass Adjustment" on Page 1−28.

- Degree of flatness = B/A × 100 [%] (refer to Photo 1−1 to photo 1−3)

Adjustment Diagram

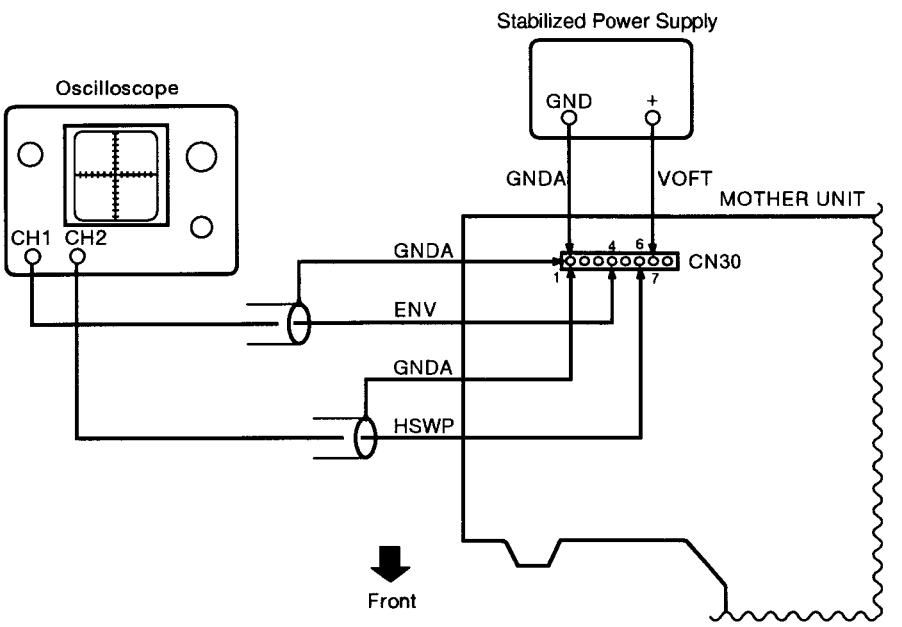


Fig. 2

Waveform

- Oscilloscope Range : 50mV/div., 1ms/div.

Normal

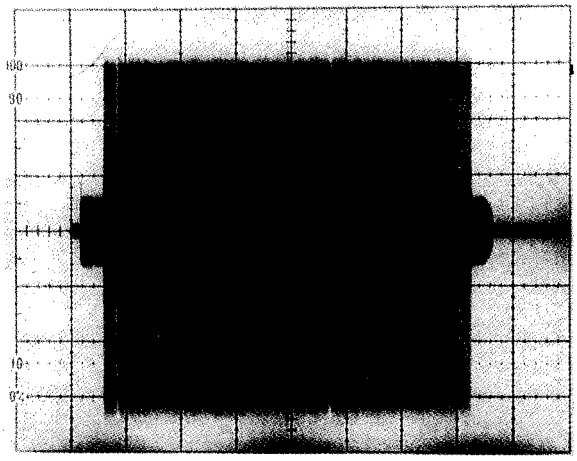


Photo 1－1

Fault on the Entry Side

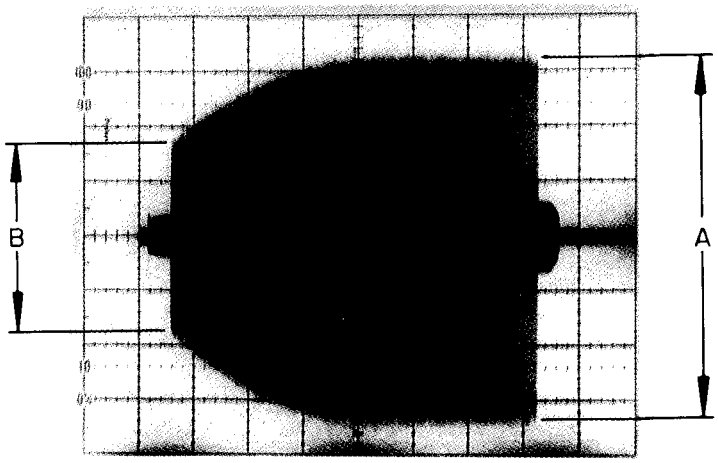


Photo 1－2

Fault on the Exit Side

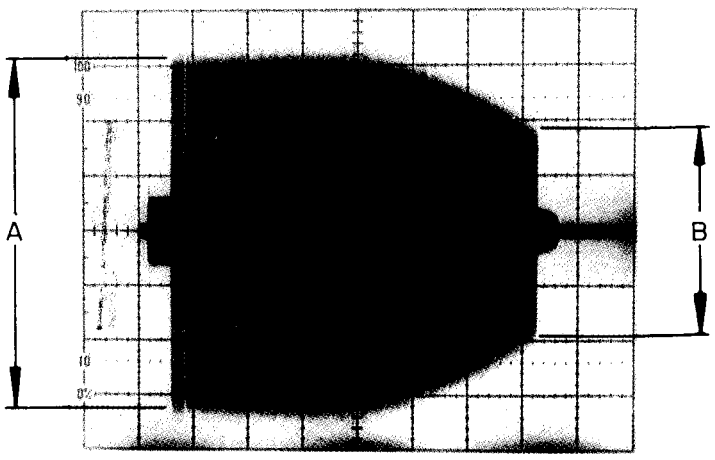


Photo 1－3

3. Tape Pass Adjustment

- Purpose : To confirm that the tape is correctly aligned with the drum assembly lead. (Tape transit adjustment)
- Symptoms of Improper Adjustment : Sound is interrupted, noise is generated, or sound quality is poor.

Measuring Device/Jig	Measuring Device Connection	DAT State	Part to be Adjusted
● Oscilloscope ● Test Tape : Tracking/ SDA−101 (TY−7251) ● Pin-face Screwdriver : R−1784 ● 0-bit Phillips Screwdriver	● Oscilloscope MAIN unit interior: CH1 : Between ENV (CN30−4) and GND A (CN30−1) CH2 : Between HSWP (CN30−6) and GND A (CN30−1).	● PLAY mode (Test mode)	● Roller guide (entry and exit sides) ● Pull guide

Adjustment Procedure

3−1. Rough adjustment of guides

1. Remove the connecting rod of the cassette control assembly. (Refer to page 1-25.)
2. Turn the entry-side / exit-side roller guides clockwise using the pin-face screwdriver (R−1784) until they lightly touch the end, and then turn them back about one rotation.
3. Turn the guide flange on the pull-arm assy until the top surface of the flange is aligned with the top of the pull-arm shaft. (Refer to Fig. 3−1.)

3−2. Fine adjustment of roller guide height

Preparation

- Mount the tracking tape (SDA−101).
- After setting the 1.5 TP test mode, produce the 2/3 waveform and play the tape. (Refer to Page 1−24.)

[Exit-Side Adjustment]

1. Inspect the RF waveform. If it resembles the waveform shown in Photo 2−4, tighten the exit-side roller guide (about 1/8 rotation). If it resembles the waveform shown in Photo 2−6, loosen the exit-side roller guide (about 1/8 rotation).

[Entry-Side Adjustment]

2. Inspect the RF waveform. If it resembles the waveform shown in Photo 2−3, tighten the entry-side roller guide (about 1/4 rotation). If it resembles the waveform shown in Photo 2−5, loosen the entry-side roller guide (about 1/4 rotation).
3. Observe the RF waveform and repeat Steps 1 and 2 above until the waveform looks like the one shown in Photo 2−2.
4. Press the Eject key, and once the tape has been ejected, repeat the procedures described in "2. Tape Pass Confirmation". (Refer to Page 1−26.)

Adjustment Diagram

- The oscilloscope connections and other connections are as indicated in "2. Tape Pass Confirmation" (Page 1−26).

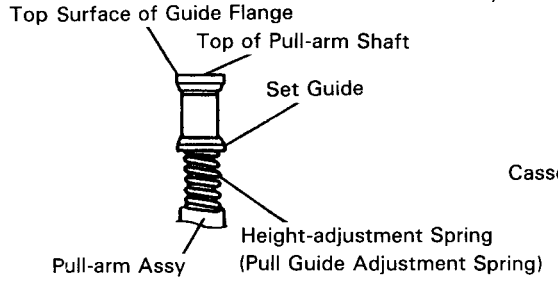


Fig. 3−1

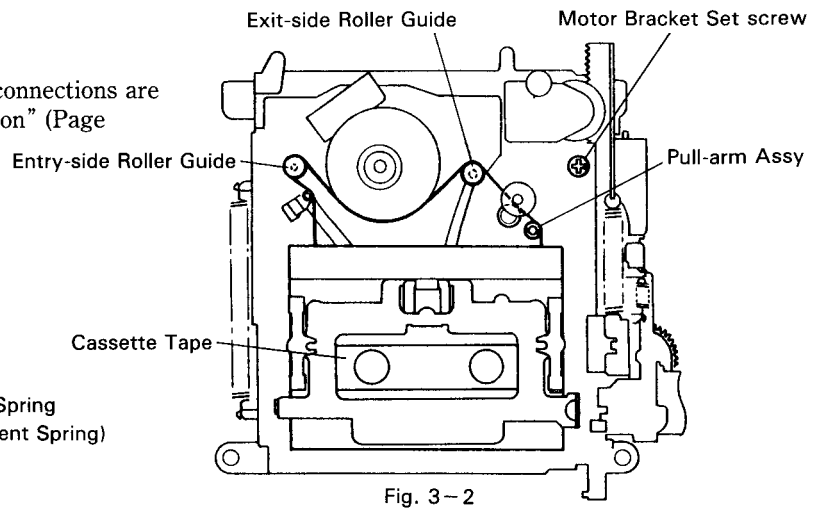


Fig. 3−2

Waveform

● Oscilloscope Range : 50mV/div., 1ms/div.

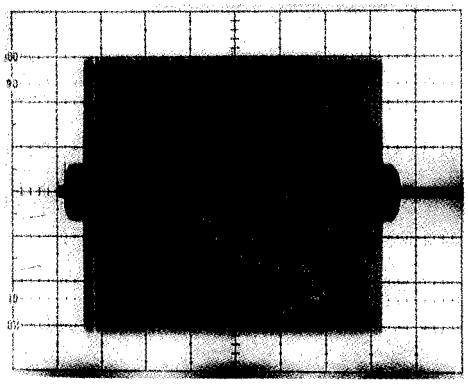


Photo 2－1
Maximum RF Output Level

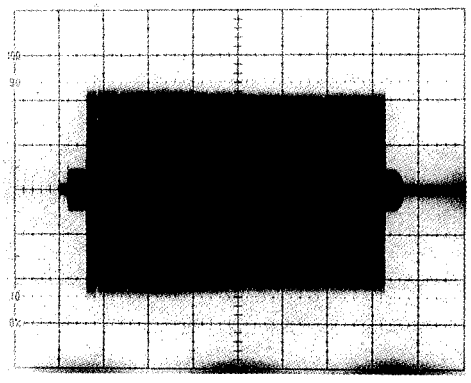


Photo 2－2
2/3 RF Output Level

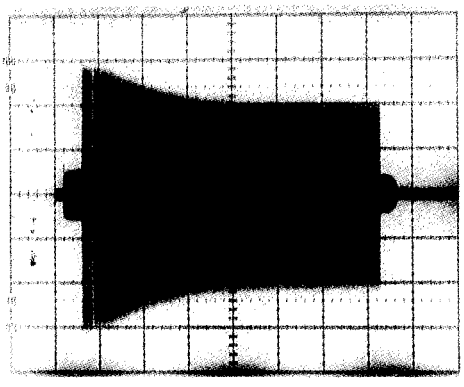


Photo 2－3
Entry-Side Guide Roller Too High

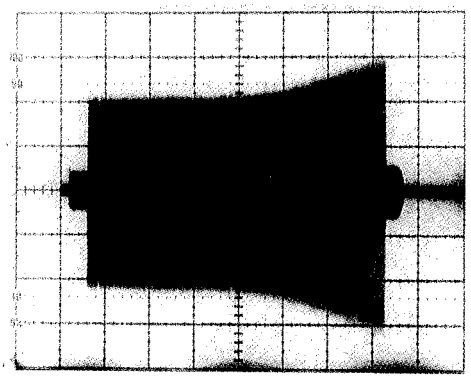


Photo 2－4
Exit-Side Guide Roller Too High

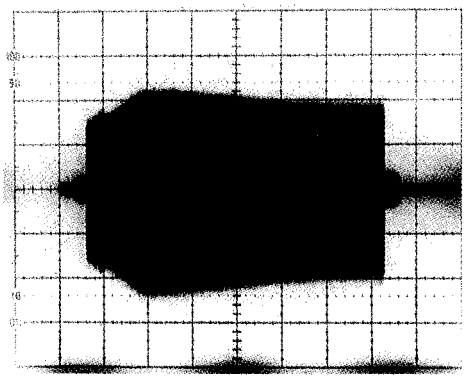


Photo 2－5
Entry-Side Guide Roller Too Low

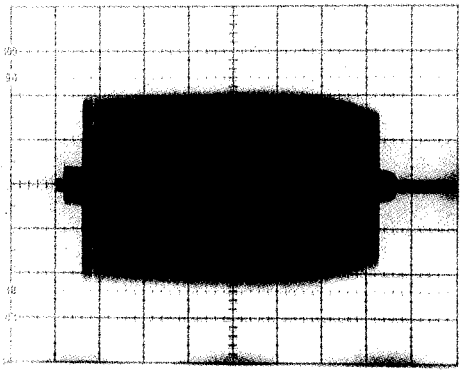


Photo 2－6
Exit-Side Guide Roller Too Low

3−3. Fine Adjustment of Pull Guide

Preparation

- Remove the connecting rod of the cassette control assembly. (Refer to page 1-25.)

Adjustment

1. Play the tape and set the CUE mode by holding down the FF/CUE key when the tape starts winding. Check for twisting of the tape between the pinch roller and the pull guide by observing the image of the motor bracket setscrew head reflected on the magnetic surface of the tape. The relationship between the reflected image of the screw head and the height of the pull-guide flange is shown in Fig. 3−3.
2. Slowly tighten the pull-guide flange, turning it 180 degrees from its rough-adjusted position, and confirm that the appearance of the reflected image continuously changes from (c) to (a) during this process.
3. Then, while loosening the pull-guide flange 180 degrees, confirm that the appearance of the reflected image continuously changes from (a) to (c).
4. Tighten the pull-guide flange until the top edge of the tape curls slightly and the screw image resembles the shape shown in (b), and then loosen the flange 90 degrees.
5. Set the REW mode by pressing and holding down the REW/REV key. Confirm that the tape does not curl at Points A and B in Fig. 3−4.
6. After confirming that the tape is not twisted at Point C in Fig. 3−5, check the tape for twisting or bulging at Point D. (Normal bulge : no more than 0.5mm)
7. Press the Eject key and eject the tape. Replay the tape, and keeping the FF/CUE key pressed down, observe the reflected image of the screw head and confirm that it has the same appearance as that shown in (c).
8. Press and hold down the REW/REV key and confirm that curling and twisting at Points A to D are the same.
9. Apply a locking adhesive to the screw on top of the pull-guide flange and lock the screw.

Adjustment Diagram

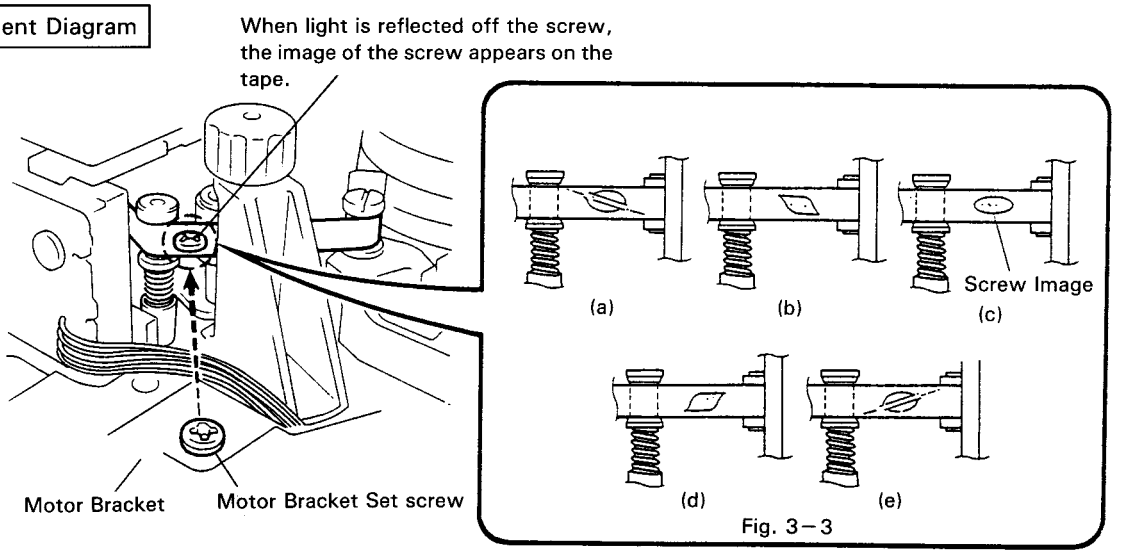


Fig. 3−3

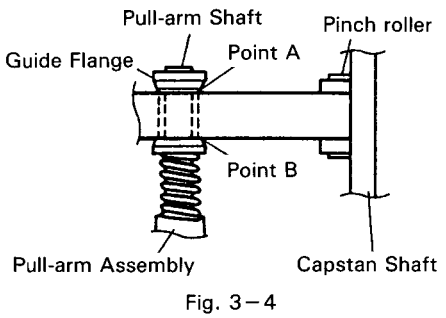


Fig. 3−4

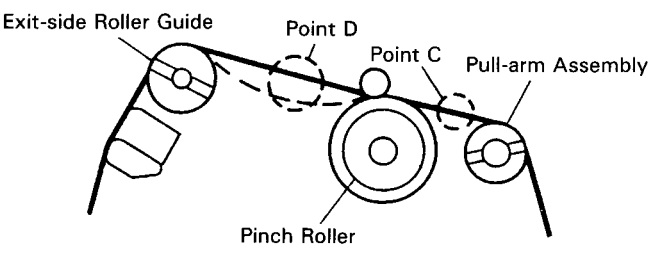


Fig. 3−5

■ ELECTRICAL SYSTEM ADJUSTMENT

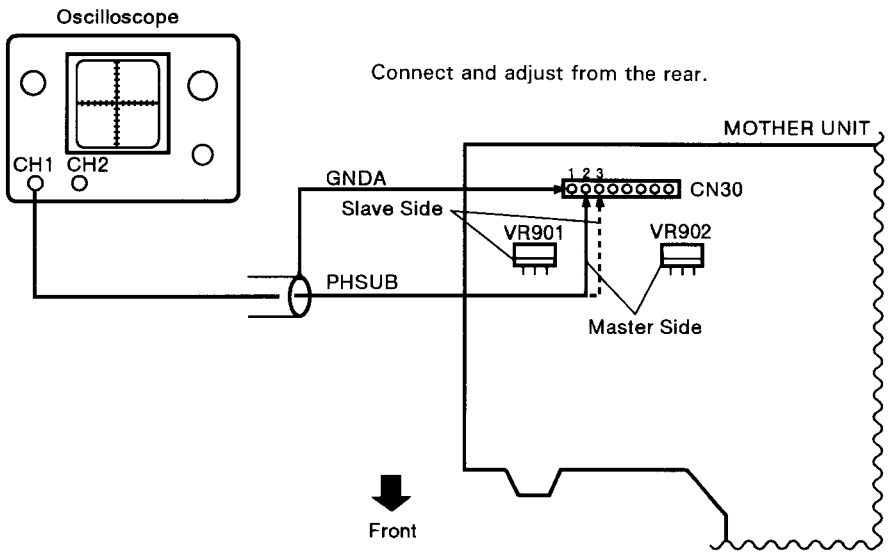
1. PLL Adjustment

- Purpose : To correctly access digital signals stored in the tape.
- Symptoms of Improper Adjustment : Sound is intermittent, unit does not playback, noise is generated, or meter fails to oscillate.

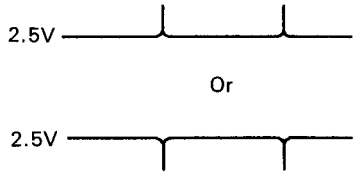
Measuring Device/Jig	Measuring Device Connection	DAT State	Part to be Adjusted
● Oscilloscope ● Test Tape Blank Tape : SDA−301	● Oscilloscope Mother unit interior : CH1 : Between PHSUBM (CN30−2) and GND A (CN30−1) Between PHSUBS (CN30−3) and GND A (CN30−1)	● STOP mode	● Mother unit VR902, VR901 (VCO RANGE ADJ.)

Adjustment Procedure (MASTER SIDE ADJUSTMENT)	Adjustment Procedure (SLAVE SIDE ADJUSTMENT)
1. Insert the test tape. 2. Set the Rec Mode key to the SP position. 3.Adjust VR902 so that the output voltage of CN30-2 (PHSUBM) becomes 2.5 V. At this time, adjust so that the pulse on the whiskers part of the waveform completely disappears or appears only slightly above or below 2.5 V. Connect and adjust from the rear.	1. Insert the test tape. 2. Set the Rec Mode key to the LP position. 3.Adjust VR901 so that the output voltage of CN30-3 (PHSUBS) becomes 2.5 V. At this time, adjust so that the pulse on the whiskers part of the waveform completely disappears or appears only slightly above or below 2.5 V.

Adjustment Diagram



Waveform



- If the beard-shaped pulses in the waveform are just slightly visible or disappear completely, adjust the voltage above or below 2.5V.

Fig. 4

2. TACH Adjustment

- Purpose : To match the recording position with the tape format.
- Symptoms of Improper Adjustment : Tapes recorded on other machines have intermittent sound or noise increases and the MUTE comes on. (Tapes recorded on this unit perform without problems.)

Measuring Device/Jig	Measuring Device Connection	DAT State	Part to be Adjusted
● Oscilloscope ● Test tape Tracking : SDA−101 (TY−7251)	● Oscilloscope Mother unit interior : CH1 : Between ENV (CN30−4) and GND A (CN30−1) CH2 : Between HSWP (CN30−6) and GND A (CN30−1)	● PLAY mode (Test mode)	● MS key "+", "−"

Adjustment Procedure

Preparation

- Set the 1.5 TP test mode. (Refer to Page 1−24.)

1. Press the MS keys "+" or "−" to adjust so that the RF waveform marker position becomes 800μs ± 20μs from the drop of the HSWP waveform.

Note

The TACH adjustment is adjustment by means of the microcomputer, where the adjustment data are stored in the memory, and as the adjusted data are stored in the memory at the time of test mode cancellation, do not switch off the power supply while in test mode.

Waveform

- Oscilloscope Range :
  CH1 : AC500mV/div., 0.1ms/div.
  CH2 : DC5V/div. (Trigger)

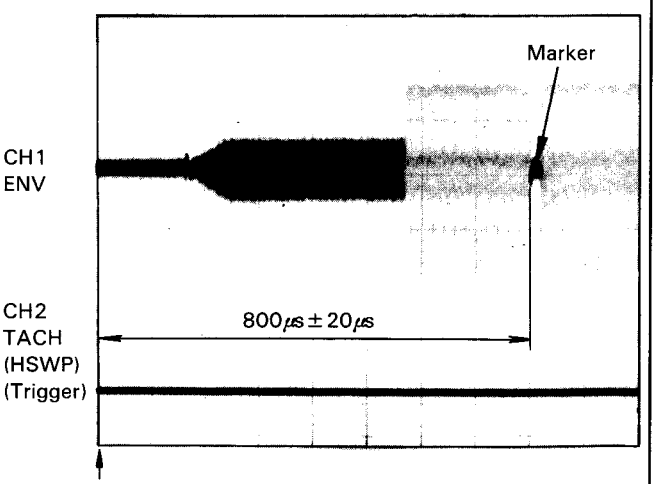


Photo 3−1

Adjustment Diagram

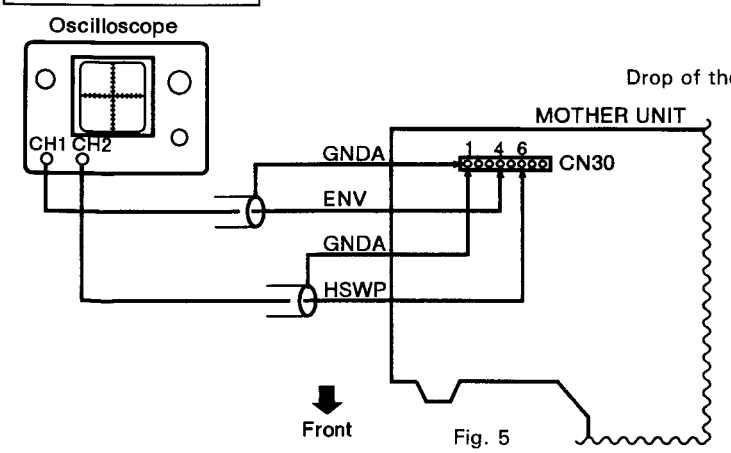


Fig. 5

3. ATF Recording Current Adjustment.

- Purpose : To obtain the ideal recording current value.
- Symptoms of Improper Adjustment : Sound is intermittent (tracking cannot be obtained) or noise is generated.

Measuring Device/Jig	Measuring Device Connection	DAT State	Part to be Adjusted
● Oscilloscope ● Test Tape Level : SDA−102 (TY−7111) Blank : SDA−302 (TY−30B) *NOTE :* *Use an unused portion of tape where RF signals have not been recorded.*	● Oscilloscope MOTHER Unit interior : CH1 : Between PLT2 (CN30−5) and GND A (CN30−1) CH2 : Between HSWP (CN30−6) and GND A (CN30−1)	● PLAY and REC modes	● REC/PLAY RF unit VR352 (A head) VR354 (B head)

Adjustment Procedure

Preparation

- Set the test mode for adjustment of recording current. (Refer to Page 1−24.)

1. Play the level-use test tape (SDA−102) and record the voltage value at Points (a) and (b) on the waveform. (Refer to Photo 4−1.)
2. Confirm that the blank tape has not been used or has an unused portion. Press the REC key and then the PAUSE key. Record the signal from the unit's built-in transmitter on the tape for 30 to 60 seconds.
3. Stop the recording and rewind the recorded portion of the tape. Confirm that the levels of the reproduced waveform are within $\pm \frac{25}{20}$ % of levels (a) and (b) recorded according to the procedure described in Step 1. (Refer to Photo 4−2.)
4. When the values are outside the standard, slightly turn VR352 for A head or VR354 for B head, and record the signal again on an unused portion of tape. Confirm the levels as described in Step 3.
5. Repeat Steps 3 and 4 and make adjustments until the values are within the standard.

Adjustment Diagram

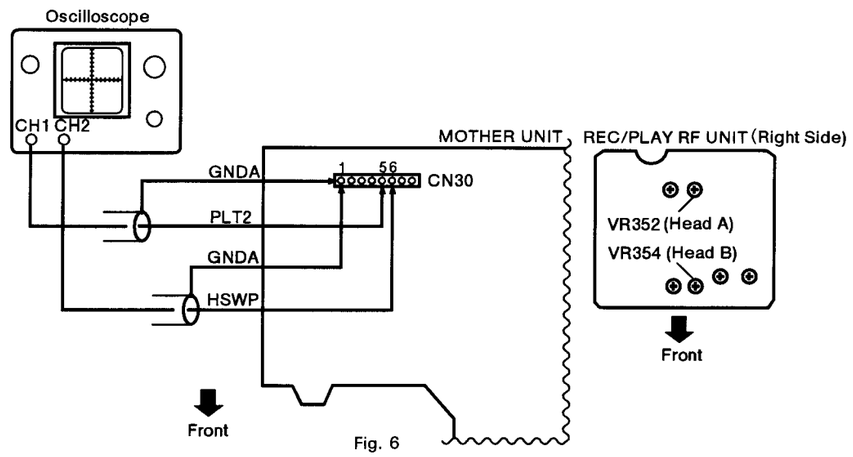


Fig. 6

Waveform [ ] : Reference

During Playback of Level Tape (SDA−102)

- Oscilloscope Range CH1 CN30−4 : 0.5V/div., CN30−5 : 0.1V/div., 2.5ms/div.
  CH2 : 5V/div.

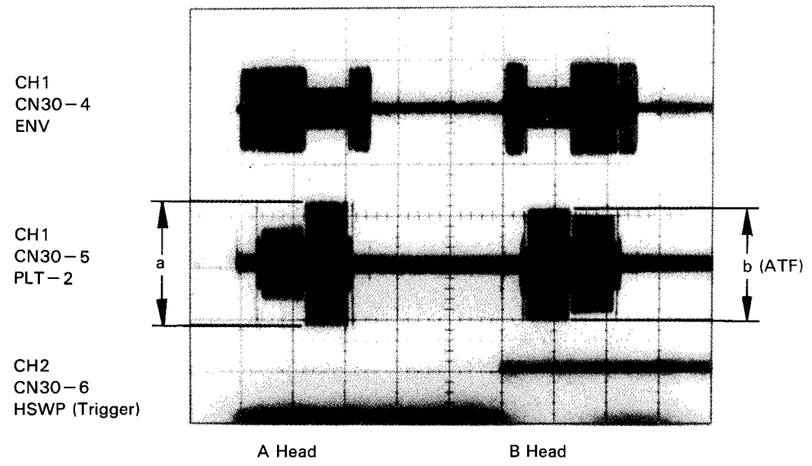


Photo 4−1

During Playback of Self-recorded Blank Tape

- Oscilloscope Range CH1 : 0.5V/div., 3ms/div. (PCM)
  [CH1 : 100mV/div., 3ms/div] (ATF)
  CH2 : 5V/div.

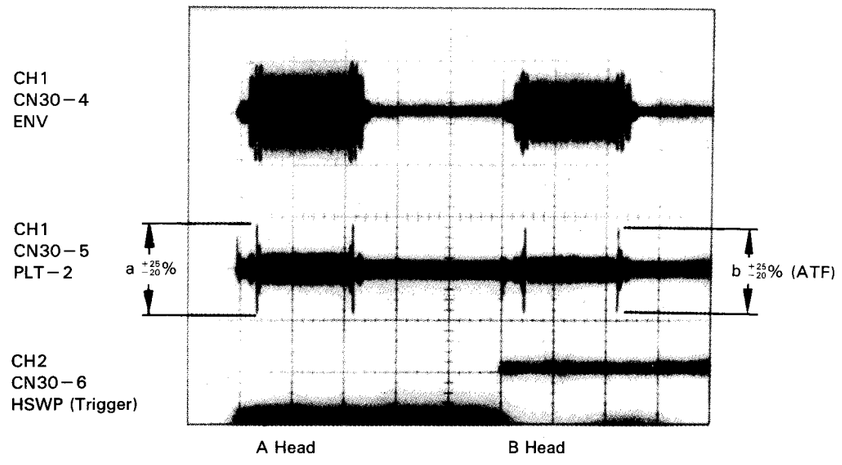


Photo 4−2

4. Error Rate Adjustment

- Purpose : To reproduce the correct data.
- Symptoms of Improper Adjustment : Units skips during playback, noise is generated, or meter does not oscillate.

Measuring Device/Jig	Measuring Device Connection	DAT State	Part to be Adjusted
● Test Tape Error Rate Adjustment Tape : SDA−111 (SP) : SDA−112 (WSP) Blank : SDA−302 (TY−30B) ● Error Rate Counter [● Oscilloscope]	● Error rate counter MOTHER unit interior Connector : CN27, CN31 ● Oscilloscope MOTHER Unit interior : CH1 : Between FLAGM (CN27−3) and GND D Between FLAGS (CN31−3) and GND D	MASTER SIDE ADJUSTMENT ● PLAY mode SLAVE SIDE ADJUSTMENT ● REC mode	● REC/PLAY RF unit VR355 (SP) ● MONITOR RF unit VR302 (SP) VR303 (WSP) VR301 (LP)

Adjustment Procedure (MASTER SIDE ADJUSTMENT)

Preparation

- Remove the lower chassis, connect the connector of the error rate counter from the rear of the circuit board to CN27 in the mother unit, and set the setting time of the error rate counter to 10 sec.
  After connector connection, install the lower chassis.

1. Play the error rate adjustment tapes (SDA−111 and SDA−112) and make adjustments so that the error rate is as small as possible.
   Adjustment standard
   Of Ach and Bch head, one shall be 100 x 10-4 or less, and the other shall be 300 x 10-4.

[If the error rate counter is not used]

1. Play the error rate adjustment tapes (SDA−111 and SDA−112) and make adjustments so that the oscilloscope waveform error flag is the same as that shown in Photo 5.
   (Adjust until the error rate is as small as possible.)

Adjustment Procedure (SLAVE SIDE ADJUSTMENT)

Preparation

- Remove the lower chassis, connect the connector of the error rate counter from the rear of the circuit board to CN31 in the mother unit, and set the setting time of the error rate counter to 10 sec.
  After connector connection, install the lower chassis.

1. Insert the test tape (SDA-302).
2. Set the recording monitor button of the set to the TAPE side.
3. Record a music signal or a suitable test signal in WSP, SP, and LP mode, and adjust so that the error rate becomes a minimum.
   Adjustment standard
   Of Ach and Bch head, one shall be 100 x 10-4 or less, and the other shall be 300 x 10-4.

[If the error rate counter is not used]

1. Insert the test tape (SDA-302).
2. Set the recording monitor button of the set to the TAPE side.
3. Record a music signal or a suitable test signal in WSP, SP, and LP mode, and adjust so that the error flag of the oscilloscope waveform becomes the same as shown in photo 5.
   (Adjust until the error rate is as small as possible.)

Adjustment Drawing

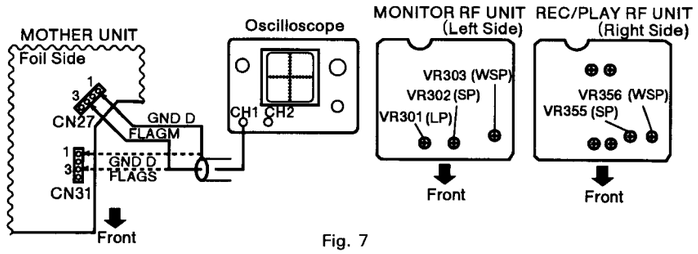


Fig. 7

Waveform

- Oscilloscope Range : 2V/div., 5ms/div.
  [During SP]

When error rate is 1×10^{-1}

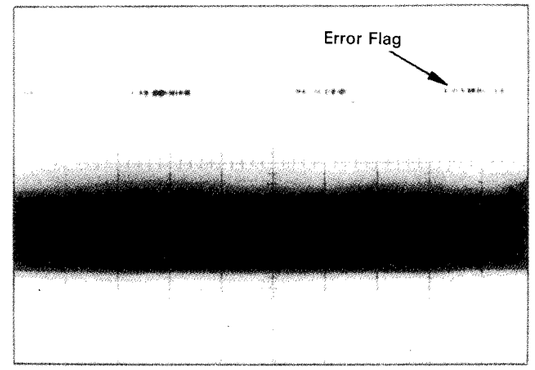


Photo 5−1

When error rate is 2×10^{-2}

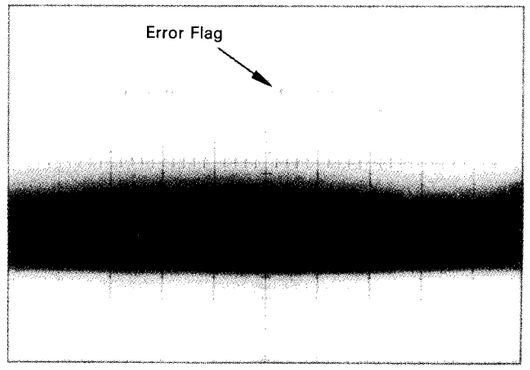


Photo 5−2

When error rate is 5×10^{-4}

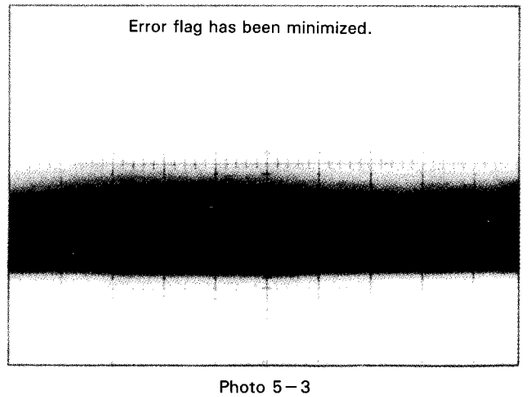
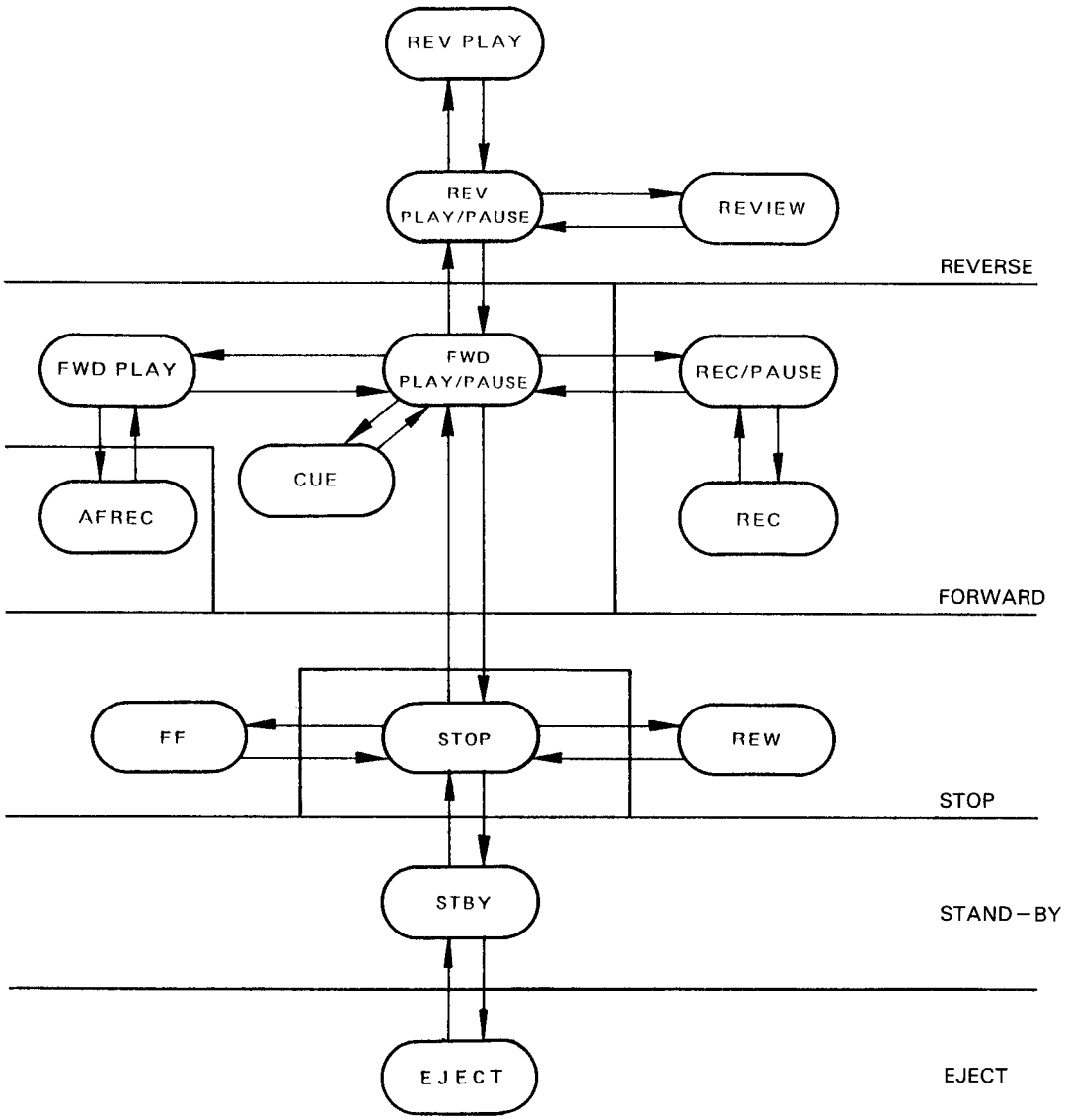


Photo 5−3

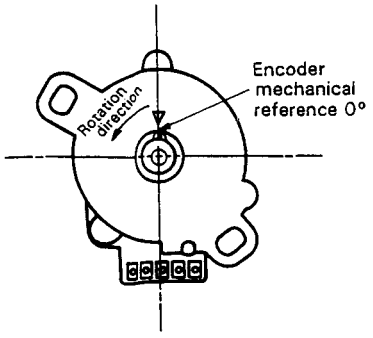
1.7 FROW CHART

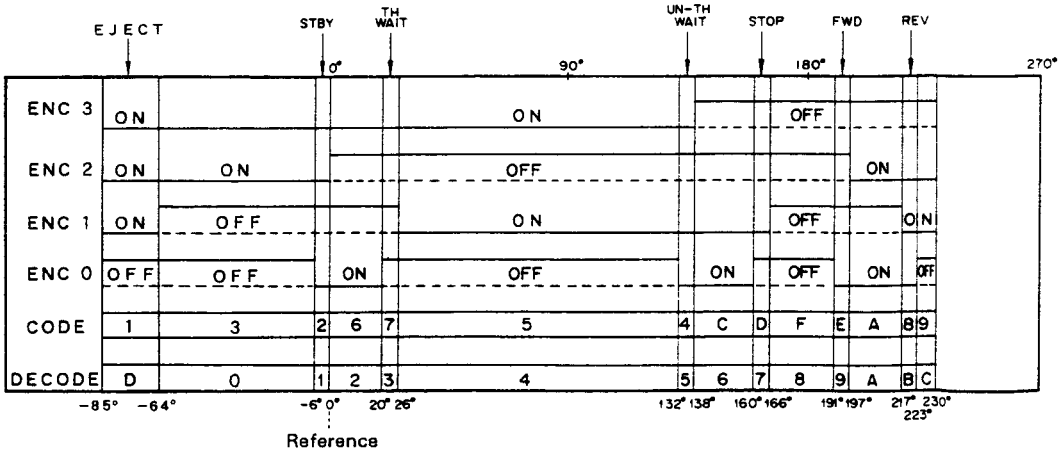
1−7−1. MECHANICAL MODE TRANSITION DIAGRAM



1−7−2. ENCODER PATTERN

• EJECT → STBY → TH WAIT (Threading wait) → UN TH WAIT (Unthreading wait) → STOP → FWD → REV

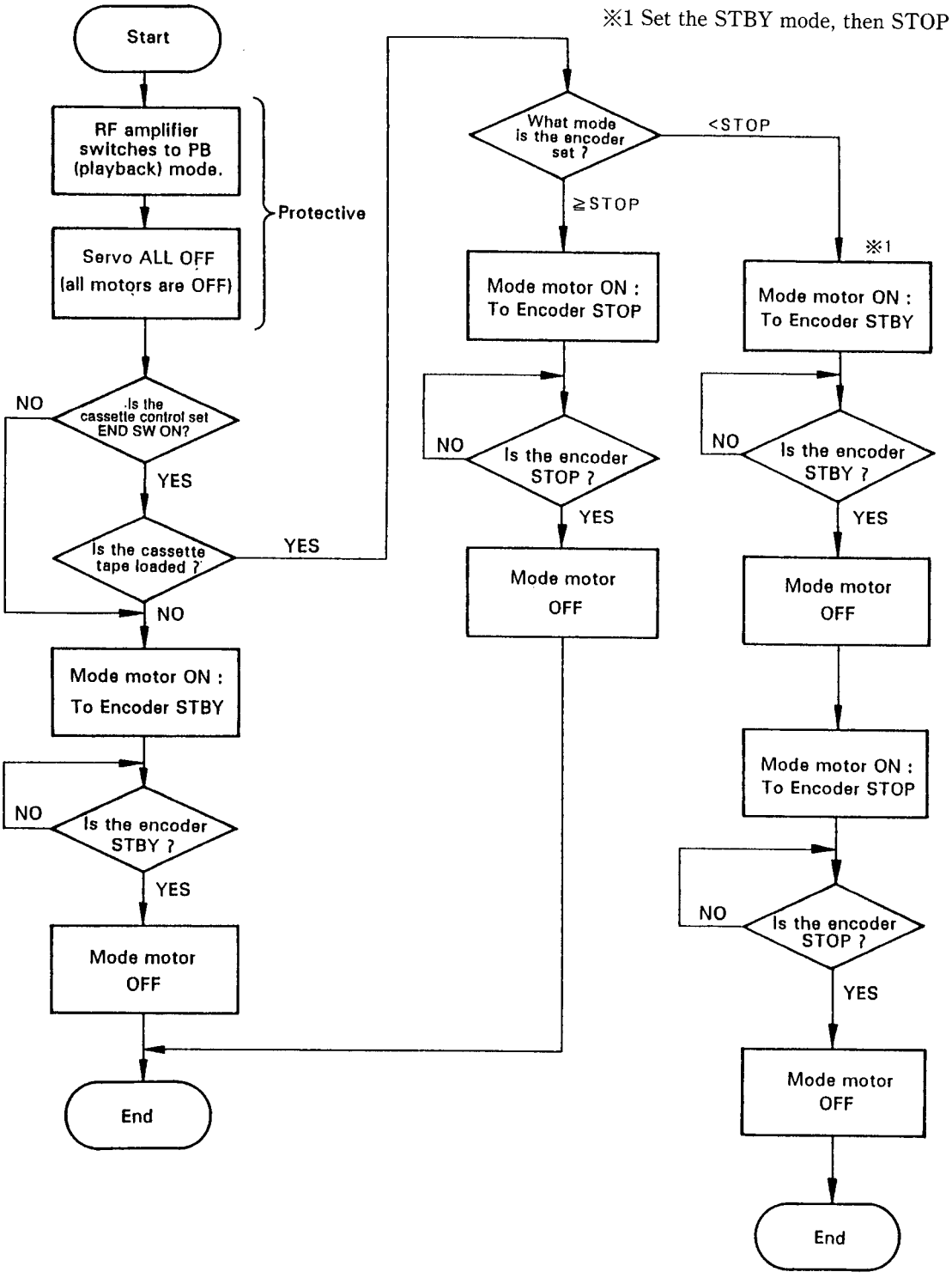




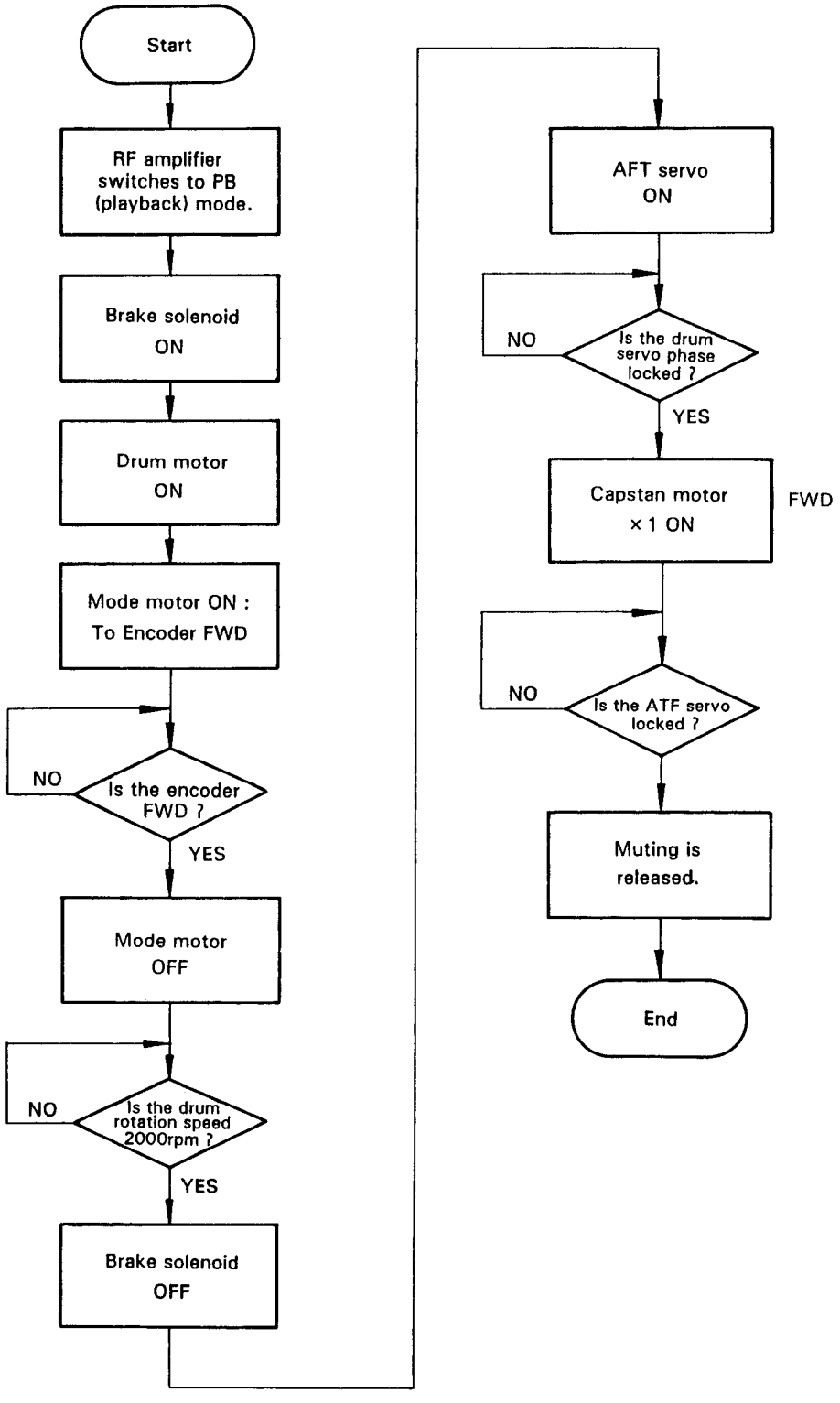
1−7−3. POWER ON

Cassette Tape Loaded → STOP
Cassette Tape Unloaded → STBY (standby, unthreading)

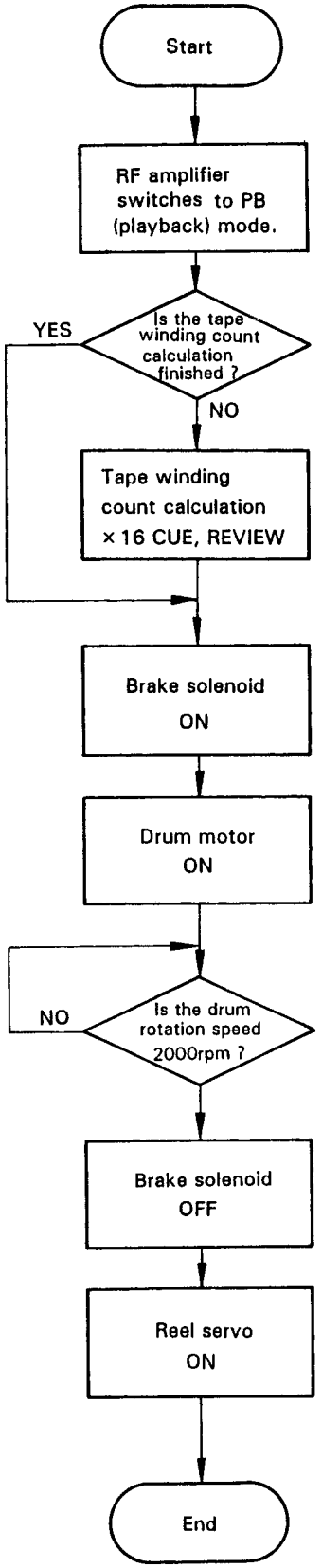
※1 Set the STBY mode, then STOP made.



1-7-4. STOP → PLAY

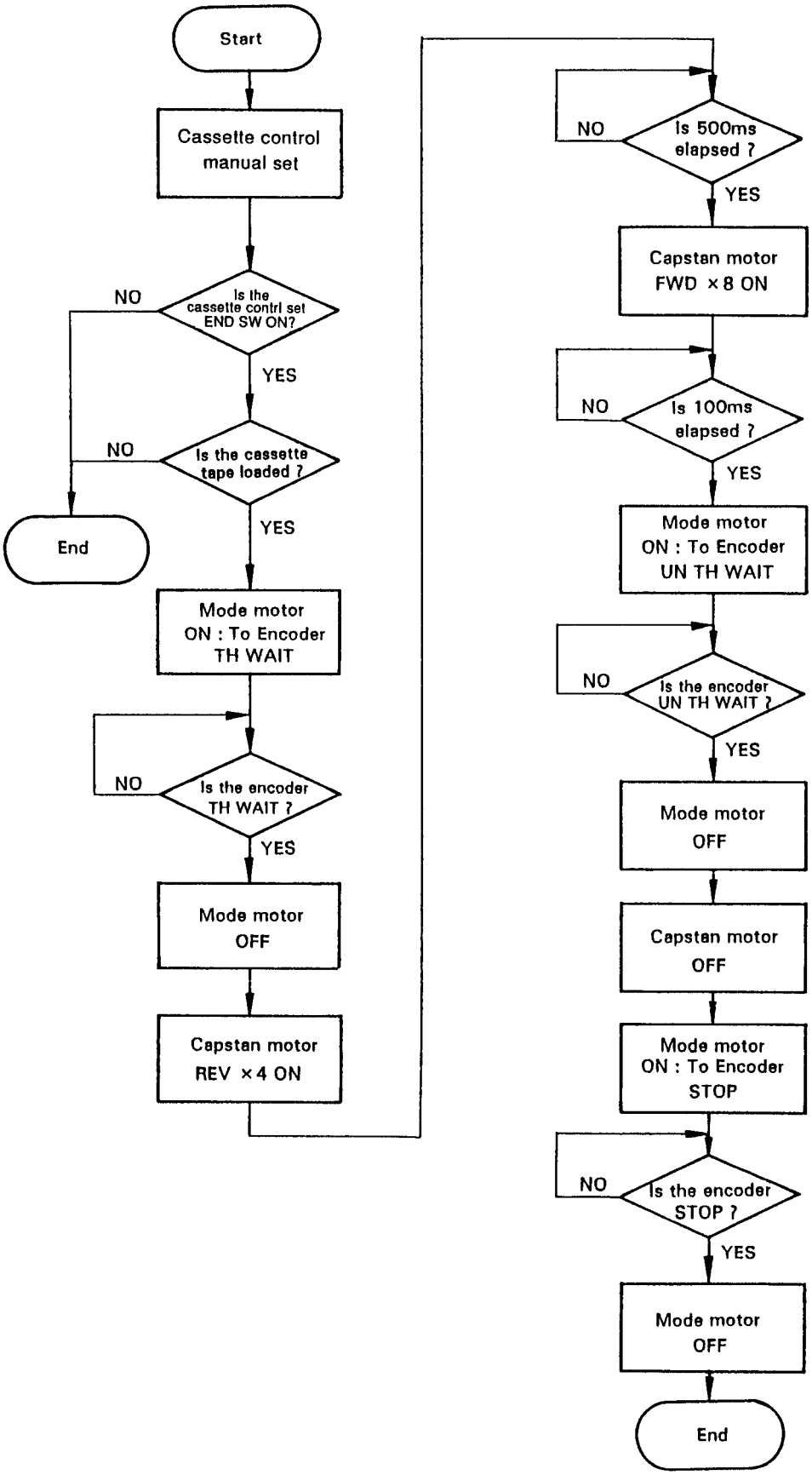


1−7−5. STOP → FF,REW

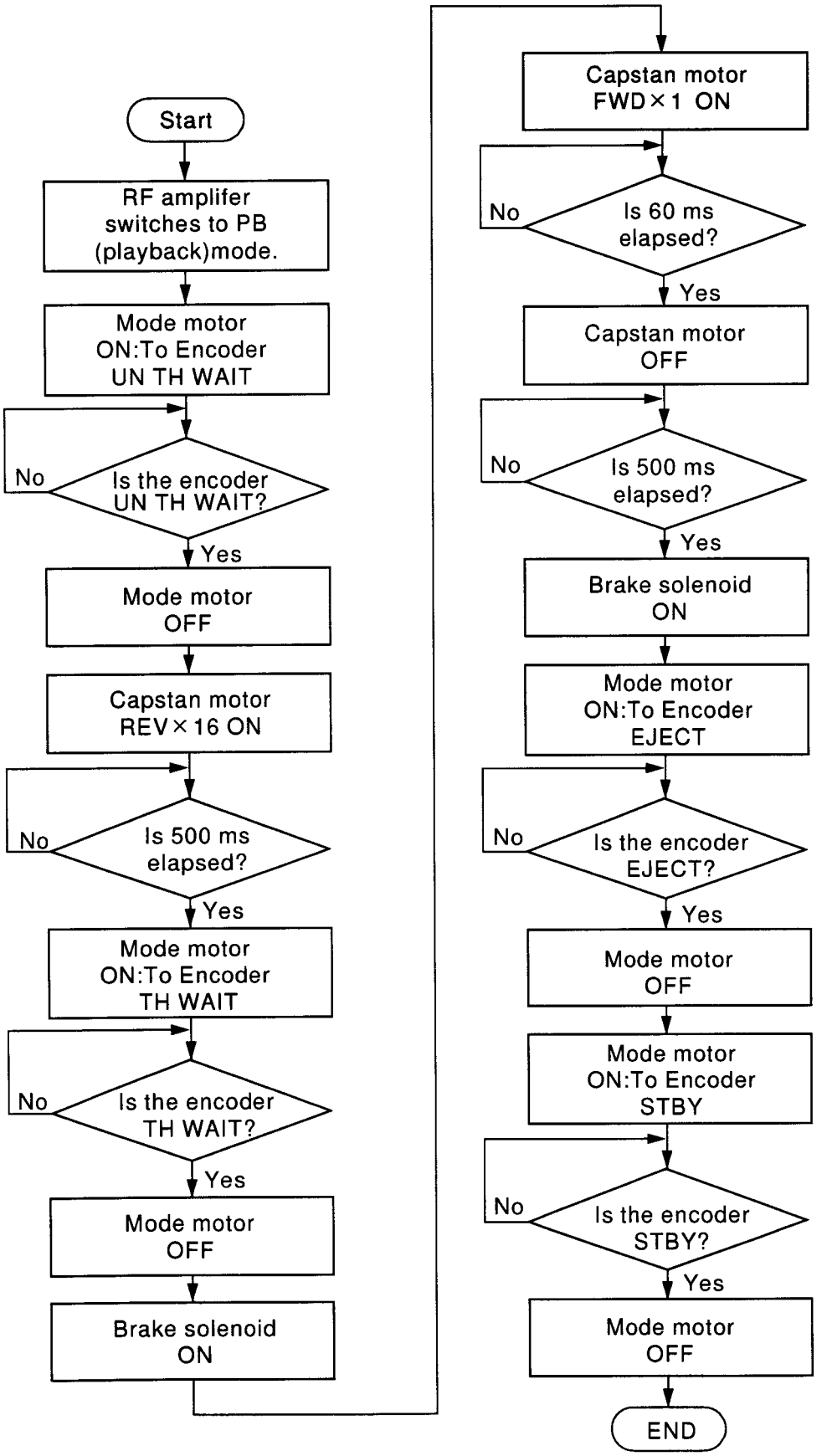


The encoder position remains at STOP.

1−7−6. OPEN → CLOSE → STOP



1−7−7. STOP → OPEN



1.8 PARTS LIST FOR PACKING AND EXPLODED VIEWS

NOTES :

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

(1). EXPLODED VIEWS

(1)−1. EXTERIOR (1/2)

Mark	No.	Description	Parts No.
	1	DISPLAY UNIT	JWZ1006
	2	KEY UNIT	JWZ1007
NSP	3	LCD CUSHION	JNM1079
	4	ROTARY KNOB A	JAA1020
	5	ROTARY KNOB B	JAA1021
NSP	6	COVER	JNV1136
	7	SLIDE KNOB A	JAC1134
	8	SLIDE KNOB B	JAC1135
	9	LCD SHIELD	JNC1137
NSP	10	EL CUSHION	JNM1078
	11	WRITE BUTTON	JAC1140
	12	ALUMINUM PANEL A	JAH1048
	13	ALUMINUM PANEL B	JAH1049
	14	ALUMINUM PANEL C	JAH1050
	15	ALUMINUM PANEL D	JAH1051
	16	PLATE A	JAH1052
	17	PLATE B	JAH1053
	18	HANDLE	JMX1003
	19	BOTTOM COVER	JNC1107
	20	DOOR BASE	JNS1193
	21	BATTERY COVER	JNS1198
	22	REAR PANEL	JNS1200
	23	SIDE GRILLE L	JNS1201
	24	SIDE GRILLE R	JNS1202
	25	LEG	WEP1027
	26	LCD BASE 2	JNV1137
	27	FRONT PANEL ASSY	JXA1178
	28	BASE ASSY	JXA1191
	29	BUTTON ASSY	JXA1180
	30	LCD BASE 1 ASSY	JXA1183
	31	CAUTION LABEL	JRW1021
	32	STUD SCREW	JBA1011
	33	SPRING R	JBH1028
	34	CRICK SPRING	JBL1022
	35	HOLDER A	JNC1102
	36	EARTH CORD ASSY	JDE1205
	37	LABEL A	JNM1076
	38	SPACER A	JNV1123
	39	HOLDER	JNV1127
	40	LATCH	JXA1187
	41	SCREW	BPZ26P050FMC
	42	SCREW	BPZ26P060FNI
	43	SCREW	BPZ26P100FMC
	44	SCREW	BST26P050FCC
	45	SCREW	TSZ26P050FCC
	46	.....	
	47	SCREW	BSZ26P060FBN
	48	SCREW	BSZ26P100FNI
	49	ALUMINUM D SCREW	JBA1013
	50	SCREW	BST26P050FNI

(1)−2. EXTERIOR (2/2)

Mark	No.	Description	Parts No.
	1	MOTHER UNIT	JWZ1013
	2	POWER SUPPLY UNIT	JWZ1014
NSP	3	LINE/MIC UNIT	JWZ1015
	4	DRIVER UNIT	JWZ1016
NSP	5	VR UNIT	JWZ1017
	6	HEADPHONE UNIT	JWZ1008
NSP	7	REM. RECEIVER UNIT	JWZ1009
	8	MECHA UNIT	EXA9005
	9	RF UNIT	EWX9001
NSP	10	CLAMPER	PEC−034
	11	SLIDE KNOB D	JAC1137
	12	CORD ASSY	JDE1185
	13	CORD ASSY	JDE1186
	14	CORD ASSY	JDE1187
	15	CONNECTOR	JDE1188
	16	SNAP PLATE	JBE1004
	17	SCREW A	JBH1026
	18	SCREW D	JBH1029
	19	SCREW E	JBH1030
	20	SCREW F	JBH1037
	21	TERMINAL SPRING	JBL1018
	22	SHAFT B	JLA1053
	23	SPACER	JLA1081
	24	REAR TERMINAL PANEL	JNB1029
NSP	25	VR BRACKET	JNC1100
NSP	26	INPUT SHIELD A	JNC1101
	27	BATTRY HOLDER	JNC1143
	28	FRONT FRAME	JNC1106
NSP	29	BRACKET L	JNC1124
	30	LABEL B	JNM1077
	31	TERMINAL HOLDER	JNV1125
	32	STOPPER	JNV1126
	33	FRAME ASSY	JXA1181
	34	CENTER FRAME ASSY	JXA1182
	35	SCREW	BMZ20P040FMC
	36	SCREW	TSZ26P050FCC
	37	SCREW	BSZ30P080FMC
	38	SCREW	BST26P040FCC
	39	SCREW	BSZ26P050FMC
	40	SCREW	BSZ26P080FMC
	41	SCREW	ASZ30P080FCC
	42	SCREW	PBZ30P080FCC
	43	SCREW	JFZ20P018FNI
	44	EARTH SPRING	JBL1021
	45	WASHER	YE12FUC
	46	HEADPHONE KNOB	JAA1022
	47	NUT	NKX1FZN
	48	SLIDE KNOB C	JAC1136
NSP	49	MECHA ASSY	EXK2508
	50	SHIELD SHEET	JNC1138
	51	HP SHIELD	JNC1139
	52	EARTH PLATE	JNC1140
	53	COVER SHEET	JEC1011
	54	SCREW	BST26P050FCC
	55	SPACER	JNV1138

(1)−3. MECHA UNIT

CASSETTE COMPARTMENT UNIT

Mark	No.	Description	Parts No.
	1	CONNECTOR ASSY 2P (J14)	JDE1204
	2	SWITCH	JSN1001
	3	ROLLER ASSY	JXA1169
	4	PRESSURE SPRING ASSY	JXA1170
	5	RINK L ASSY	JXA1171
	6	RINK R ASSY	JXA1172
	7	SIDE SHASSIS L ASSY	JXA1173
	8	SIDE SHASSIS R ASSY	JXA1190
	9	FIXED PLATE ASSY	JXA1175
	10	DAMPER UNIT	CXA5631
	11	SPRING R	JBH1039
	12	SPRING AB	JBH1034
	13	SPRING L	JBH1035
	14	SPRING SP	JBH1036
	15	SHAFT A	JLA1086
	16	SHAFT B	JLA1087
	17	SHAFT C	JLA1088
	18	ROLLER	JLA1089
	19	ROLLER RD	JLA1077
	20	TOP PLATE	JNC1115
	21	DAMPER ARM	JNC1116
	22	BASE ARM	JNC1117
	23	COMPARTMENT	JNC1118
	24	CONNECTING ROD	JNC1119
	25	SLIDE PLATE	JNC1120
	26	LEVER	JNC1121
	27	BRACKET ASSY	JXA1185
	28	GEAR A	JNV1130
	29	GEAR B	JNV1131
	30	SCREW	BMZ20P040FMC
	31	SCREW	CBA1070
	32	SCREW	JFZ20P018FNI
	33	SCREW	JFZ20P025FNI
	34	SCREW	JGZ20P030FMC
	35	WASHER	WT12D035D025
	36	WASHER	WT16D035D025
	37	E RING	YE12FUC
	38	E RING	YE15FUC
	39	GEAR	JNV1134

DAT MECHA UNIT

Mark	No.	Description	Parts No.
	1	CLAMPER	HEF−102
	2	SWITCH (S102)	ESG9001
	3	.....	.....
	4	SWITCH 2P	ESG1001
	5	ENCODER ASSY	JSX1007
	6	POWER MOTOR	CXM1020
	7	SOLENOID	EXP9001
	8	PHOTO REFLECTOR (Q101, Q102) (REEL SENSOR)	GP2S24C
	9	PHOTO REFLECTOR ASSY (Q103) (END SENSOR)	EXX9002
	10	PHOTO REFLECTOR ASSY (Q104) (TOP SENSOR)	EXX9001
	11	.....	.....
	12	DRUM ASSY	EXH9010
	13	BRACKET L ASSY	EXA1117
	14	PINCH ARM ASSY	EXA1118
	15	PINCH DRIVE ARM ASSY	EXA1119
	16	TR ARM ASSY	EXA1122
	17	DRIVE GEAR ASSY	EXA1123
	18	SWING ARM ASSY	EXA1124
	19	REEL BASE ASSY	EXA1125
	20	ROLLER GUIDE	EXA1129
	21	TR ARM BRACKET ASSY	EXA1184
	22	TR BAND ASSY	EXA1185
	23	SLIDER PLATE	ENE1006
	24	SENSOR BRACKET R	ENV1236
	25	STABILIZER	ENV1192
	26	TR LEVER	ENV1194
	27	TR BRAKE	ENV1195
	28	PULL ARM	ENV1197
	29	REEL GEAR	ENV1251
	30	REEL HUB	ENV1252
	31	IDLER GEAR	ENV1253
	32	CLUTCH DRUM	ENV1254
	33	PULLEY GEAR	ENV1255
	34	CHANGE ARM	ENV1256
	35	BRAKE LEVER	ENV1257
	36	BRAKE PLATE	ENV1258
	37	CHANGE LEVER	ENV1259
	38	REV BRAKE	ENV1260
	39	MOTOR GEAR	ENV1231
	40	WORM GEAR	ENV1232
	41	WORM WHEEL	ENV1233
	42	DRIVE GEAR	ENV1234
	43	CAM	JNV1122
	44	INTERVAL GEAR	ENV1238
	45	MODE PLATE	ENV1239
	46	HARD BRAKE	ENV1240
	47	DRIVE ARM	ENV1241
	48	THREADING GEAR	ENV1242
	49	THREADING ARM L	ENV1243
	50	THREADING ARM R	ENV1244

Mark	No.	Description	Parts No.
	51	THREADING LINK L	ENV1245
	52	THREADING LINK R	ENV1246
	53	SLIDER L	ENV1247
	54	SLIDER R	ENV1248
	55	PINCH ROLLER	ENT1016
	56	BELT	ENT1017
	57	PULL GUIDE FLANGE	ELA2025
	58	TAPE GUIDE	ELA2022
	59	EARTH SPRING	EBL1004
	60	REEL WASHER	EBF1014
	61	SENSOR SHEET	EEF1001
	62	BRAKE FELT	ENM1019
	63	DAMPER	ENT1021
	64	TAPE GUIDE	ENV1282
	65	BRAKE SHOE	ENT1022
	66	CAPSTAN DD UNIT	EXH9007
	67	PINCH-GUIDE SPRING	EBH9005
	68	TR ARM SPRING	EBH1237
	69	PULL-GUIDE SPRING	EBH1222
	70	SPRING	EBH1223
	71	TR BRAKE SPRING	EBH1224
	72	IDLER GEAR SPRING	EBH1226
	73	REEL HUB SPRING	EBH1227
	74	BRAKE PLATE SPRING	EBH1228
	75	BRAKE LEVER SPRING	EBH1229
	76	REV BRAKE SPRING	EBH9006
	77	CHANGE ARM SPRING	EBH1231
	78	DRIVE ARM SPRING	EBH1232
	79	HARD BRAKE SPRING	EBH1233
	80	THREADING ARM SPRING (L)	EBH1238
	81	THREADING ARM SPRING (R)	EBH1239
	82	SCREW	BBZ20P060FZK
	83	SCREW	BMZ20P040FMC
	84	SCREW	PMS20P025FMC
	85	SCREW	JGZ20P030FMC
	86	WASHER	WT16D040D050
	87	WASHER	WT16D032D025
	88	WASHER	WT10D035D025
	89	WASHER	WA16D032D025
	90	WASHER	WA16D032D013
	91	.....	.....
	92	SCREW	EBA1025
	93	WASHER	EBE1002
NSP	101	CONNECTOR ASSY 5P (J15)	EDX9015
NSP	102	CONNECTOR ASSY 6P (J13)	EDX9013
NSP	103	LEAD CARD 12P (J12)	EDH9005
NSP	104	REEL SENSOR BOARD	ENP9016
NSP	105	CHASSIS ASSY	EXA9008
NSP	106	MOTOR BRACKET ASSY	EXG9037
	107	DRIVE LEVER	ENR1014

(2). PACKING

Mark	No.	Description	Parts No.
NSP	1	WARRANTY CARD	ARW−088
	2	SHOULDER BELT	JAX1011
	3	SOFT CASE	JAX1012
	4	CONNECTION CORD	JDE1196
	5	BATTERY PACK (D−B101)	JEX1005
NSP	6	BATTERIES (R03)	JEX1006
	7	REMOTE CONTROL UNIT (CU−D013)	JPX1001
	8	OPERATING INSTRUCTIONS	JRD1020
⚠	9	AC ADAPTOR	JWR1020
	10	UNIT BOX	JHG1093
	11	MIRROR MAT SHEET	JHL1069
	12	PROTECTOR L	JHP1017
	13	PROTECTOR R	JHP1018
	14	PARTS BOX	JHW1027
	15	BATTERY COVER	JXX1283
	16	HANDLE	JHW1028
	17	.....	.....
	18	REINFORCING BOARD	JHW1029

1.9 PCB PARTS LIST

NOTES :

- *Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω → 56 × 10¹ → 561 ····· RD1/8PM 5 6 1 J
47kΩ → 47 × 10³ → 473 ····· RD1/4PS 4 7 3 J
0.5Ω → 0R5 ····· RN2H 0 R 5 K
1Ω → 010 ····· RS1P 0 1 0 K

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ → 562 × 10¹ → 5621 ····· RM1/4PC 5 6 2 1 F

Mark	No.	Description	Parts No.
LIST OF ASSEMBLIES			
NSP	MAIN UNIT		JWM1158
	├─MOTHER UNIT		JWZ1013
	├─POWER SUPPLY UNIT		JWZ1014
NSP	├─LINE/MIC UNIT		JWZ1015
	├─DRIVER UNIT		JWZ1016
NSP	└─VR UNIT		JWZ1017
NSP	SUB UNIT		JWM1155
	├─DISPLAY UNIT		JWZ1006
	├─KEY UNIT		JWZ1007
	├─HEADPHONE UNIT		JWZ1008
NSP	└─REM. RECEIVER UNIT		JWZ1009
NSP	MECHA ASSY		EXK2508
	└─RF UNIT		EWF9002
NSP	├─ REC/PLAY RF UNIT		EWY9002
NSP	└─ MONITOR RF UNIT		EWY9003
	AC ADAPTOR		JWR1020
MOTHER UNIT			
SEMICONDUCTORS			
	IC905		AK5340A−VS
	IC505, IC509		HD49226AFS
	IC601		HD49228FS
	IC903, IC904		HD49229
	IC515		TC74HC00AF
	IC908		TC74HC04AF
	IC901, IC902		TC74HC08AF
	IC909		TC74HC10AF
	IC511, IC514		TC74HC153AF
	IC503, IC508		TC74HC157AF
	IC516		TC74HC32AF
	IC513		TC74HC595AF
	IC911		TC74HC74AF
	IC507, IC510		HM62256BLFP
	IC609, IC610		LB1687M
	IC731, IC831		NJM4565DD
	IC603		NJM2902M
	IC403, IC604		NJM2904M
	IC733, IC833		NJM5532DD
	IC517		PDB083A−K
	IC512		PDG131A−K
	IC906		PD2029A
	IC401, IC402, IC404		PQ05SZ1
	IC502, IC522		TC7WU04F
	IC520		PST529D
	IC602		TC4053BF
	IC521		TC4S81F
	IC501, IC907		TC74HCU04AF
	Q501, Q506−Q508, Q605, Q608, Q611, Q904		DTA114EU
	Q735, Q835		DTA124EU
	Q509, Q603, Q615, Q616, Q620, Q901−Q903		DTC114EU
	Q736, Q836		DTC124EU
	Q630		DTA123JUA
	Q401		2SA1241
	Q504, Q505, Q601, Q602, Q609, Q610, Q625		2SC4081
	Q404		2SC3076
	Q733, Q734, Q737, Q833, Q834, Q837		2SD2114K
	D503, D506, D731, D831		DAN202K
	D502, D505, D732, D832		DAP202K
	D504, D599, D733, D833, D902		DA119
	D501		KV1550NT
	D401, D402		MA153−MC
COILS AND FILTERS			
	L501		JTF1037
	L909, L911, L912		JTF1041
	L516, L517, L908		JTF1042
	L503		JTF1043
	L605, L610		JTF1044
⚠	L701, L801, L502		JTF1050
	L602, L606		JTF1045
	L603		JTF1046
	L518		JTF1048
	T501		JTF1047
	F609, F901−F903, F905		JTF1036
⚠	F502		JTF1038
⚠	L907, L910, L913		JTF1022
	F505, F508−F510, F512, F513, F515		JTF1049
⚠	L504, L519		JTF1051
SWITCHS AND RELAYS			
	SW731		JSH1009
	SW732		JSH1011
CAPACITORS			
	C916, C929		CCSQCH030C50
	C742, C743, C842, C843		CCSQCH050C50
	C921, C934		CCSQCH060D50
	C919, C932		CCSQCH080D50
	C910, C924		CCSQCH100D50

Mark	No.	Description	Parts No.
	C527, C544, C518, C966, C968−C970		CCSQCH101J50
	C528, C529, C546, C548, C937		CCSQCH120J50
	C935		CCSQCH150J50
	C575		CCSQCH181J50
	C936, C938		CCSQCH200J50
	C668, C735, C835		CCSQCH221J50
	C918		CCSQCH270J50
	C609, C699		CCSQCH331J50
	C741, C841		CCSQCH390J50
	C509, C510, C646, C653, C967		CCSQCH470J50
	C577, C580, C581, C601, C602, C758, C858, C942		CCSQCH471J50
	C605, C613, C595, C597		CCSQCH560J50
	C611, C689		CCSQCH561J50
	C552, C734, C834, C948, C955		CEA100M50LS
	C411, C412, C415, C416, C551		CEA101M10LS
	C956		JCH1019
	C504, C508		CEA330M35LL
	C614, C750, C850, C951		CEA4R7M50LS
	C402, C403, C406, C407, C652, C747, C748, C847, C848, C903, C904, C906, C908, C922, C962		CEA470M16LS
	C736, C754, C836, C854		CEAS101M16
	C944		JCH1020
	C637		CEVNP010M50
	C620		CEVNP3R3M25
	C638		CEVNP4R7M16
	C683		CEVR47M50
	C622−C624, C626, C629		CEV010M50
	C619		CEV100M16
	C634, C569		CEV4R7M35
	C506, C511, C520, C554, C556, C560, C564, C630, C656, C657−C659, C666, C669, C675, C947, C964		CEV470M16
	C749, C752, C753, C849, C852, C853		CEZA100M63
	C756, C856		CFTXA273J50
	C745, C845		CFTXA472J50
	C746, C846		CFTXA561J50
	C744, C844		CFTXA683J50
	C401, C404, C405, C408−C410, C417, C418, C434, C596, C598, C599, C612, C617, C628, C631, C698		CKSQYB102K50
	C505, C507, C525, C526, C542, C543, C576, C625, C627, C649, C662−C665, C671, C672−C674, C913, C917, C920, C927, C931, C933, C945, C946, C965		CKSQYB103K50
	C645		CKSQYB123K50
	C639		CKSQYB153K50
	C604, C607, C608, C632, C635, C661, C912, C925		CKSQYB222K50
	C914, C928		CKSQYB223K50
	C621		CKSQYB332K50
	C517, C618, C644, C911, C926, C957		CKSQYB472K50
	C519, C521, C524, C530, C536, C539, C541, C547, C550, C555, C557, C561, C563, C565, C574, C615, C616, C633, C641−C643, C651, C660, C667, C670, C676−C682, C687, C688, C697, C751, C755, C851, C855, C901, C902, C905, C909, C923, C949, C961, C958, C570, C840, C532, C740, C757, C960, C950		CKSQYB473K50
	C636		CKSQYB683K25
	C413, C414, C422, C501, C503, C512, C513, C522, C553, C566, C568, C578, C582, C640, C733, C833, C915, C930, C943, C952−C954		CKSQYF104Z50
⚠	C435, C590		CQFA104J50
	C971		CQFA473J50
	C433, C523, C531, C540, C545		JCE1132
	C738, C838		JCE1133

Mark	No.	Description	Parts No.
RESISTORS			
	VR901, VCR902		JCP1022
	R675, R676		RS1/2PMFR47J
	R748, R749, R848, R849		JCN1037
	Other Resistors		RS1/10S□□□J
OTHERS			
	CN020	CONNECTOR	B12B−PH−K−S
	CN014	CONNECTOR	B2B−PH−K−S
	CN027, CN031	CONNECTOR	S04B−PH−SM3−TB
	CN015	CONNECTOR	B5B−PH−K−S
	CN013	CONNECTOR	B6B−PH−K−S
	CN019	CONNECTOR	B7B−PH−K−S
	CN030	CONNECTOR	B8PS−BC−1
	CN025	CONNECTOR	JDE1195
	CN018	CABLE HOLDER	51039−0500
	CN023	CABLE HOLDER	51039−0600
	CN024	CABLE HOLDER	51052−0300
	CN026	CONNECTOR	52004−1010
	CN017	CONNECTOR	52045−1010
	CN012	CONNECTOR	52045−1245
	CN010, CN011	CONNECTOR	52045−1545
	CN016	CONNECTOR	53014−0610
	CN033	CONNECTOR	53022−0810
	CN032	CONNECTOR	53022−0910
	CN021	CONNECTOR	53178−0810
	CN035	CONNECTOR	JDE1202
	JA901	JACK	JKB1001
	JA503	JACK	JKB1002
	JA501	JACK	JKB1003
	JA502	JACK	TORX178A
	TP601	PIN	RT−08T−1.3B
	X503	OSCILLATOR	JSS1019
	X501, X502	OSCILLATOR	JSS1020
	X901	OSCILLATOR	JSS1021
	X902	OSCILLATOR	JSS1022

POWER SUPPLY UNIT

SEMICONDUCTORS

Mark	No.	Description	Parts No.
⚠	IC002, IC014		ICP−N20
⚠	IC001, IC008, IC013		ICP−N25
⚠	IC007		ICP−N38
	IC003		NJM062M
	IC004, IC009, IC010		NJM2904M
	IC015		S−80750AN−JE
	IC006		NJM78L05UA
	IC005		NJM79L05UA
	IC012		S−81250PG−PD
	IC011		TC4053BF
	Q008, Q011, Q013, Q024−Q026		DTA114EK
	Q006, Q007		DTA114YK
	Q016, Q018, Q027		DTC114YK
	Q001, Q005, Q009, Q010, Q012, Q014, Q015, Q017, Q023		DTC124XK
	Q003		2SA1162
⚠	Q002		2SA1469
	Q019, Q021		2SB1122
⚠	Q020		2SB1203
⚠	Q004		2SD1682
⚠	Q022		2SD1803
⚠	D003, D004		JCX1001
	D018		MA152WA−MO
	D013−D016		DZD5R1X
	D017		DZD6R8XY
⚠	D006		SB10−05PCP

Mark	No.	Description	Parts No.
⚠	D005		SB20−03
⚠	D007		5GWJ2CZ47C
⚠	D001, D002, D008, D009, D012		1SR35−100A−93
	D010, D011		MA151A−MA
SWITCHS AND RELAYS			
⚠	RY001		JSR1027
CAPACITORS			
	C008, C013, C014		CEAS102M16
	C007		CEAS222M16
	C001, C002		CEAS470M16
	C022, C023		CEA100M50LS
	C012		CEA101M10LS
	C015−C019		CKSQYB102K50
	C009, C021		CKSQYB104K16
	C003−C006, C010, C011, C020, C024		CKSQYF104Z50
RESISTORS			
	R005		RN1/2VR22JL
	R006		RN1/2V010JL
	R024−R028		RN2V100JL
	R029, R030		RN2V3R9JL
	R057, R058		RS1/2S271J
	Other Resistors		RS1/10S□□□J
OTHERS			
	CN001	CONNECTOR	B3B−EH
	CN004	CONNECTOR	B5B−EH
	CN002	CONNECTOR	B5B−EH−K
	CN005	EARTH TERMINAL	JKF1010
	CN003	CABLE HOLDER	51020−1000
		HEAT SINK	JNC1123

LINE/MIC UNIT

Mark	No.	Description	Parts No.
SEMICONDUCTORS			
	IC701		UPC4572C
SWITCH			
	SW701		JSH1009
CAPACITORS			
	C703, C803		CCSQCH100D50
	C702, C802		CEA100M35NPLL
	C707, C807		CEA330M35
	C701, C710, C801, C810		CEALNP4R7M50
	C704, C804		CEA470M35
	C713		CKSQYF104Z50
	C706, C806, C712		CKSQYB473K50
	C711, C811		CCSQCH471J50
RESISTORS			
	All Resistors		RS1/10S□□□J
OTHERS			
	CN123	CABLE HOLDER	52007−0610
	CN124	CONNECTOR	52011−0310
	JA702	JACK	JKB1001
	JA701	JACK	JKN1019
⚠	L702, L703, L802, L803		JTF1050

DRIVER UNIT

Mark	No.	Description	Parts No.
SEMICONDUCTORS			
	IC605		NJM2904M
	IC405		S−80250AG−GB
	IC606		TD62M4700F
	Q606, Q617, Q623, Q624		DTA114EK
	Q621		DTA115EK
	Q604, Q613, Q614, Q622		DTC114EK
	Q612, Q618		2SC4097
	Q405, Q607		2SD1801
	Q619		2SD1803
	D606		1SR35−100A
CAPACITORS			
	C686		JCE1134
	C421		JCE1132
	C419, C420		CKSQYF104Z50
RESISTORS			
	R674		RN1/2PR22JL
	Other Resistors		RS1/10S□□□J
OTHERS			
	CN133	CONNECTOR	52024−0810
	CN132	CONNECTOR	52024−0910

VR UNIT

Mark	No.	Description	Parts No.
RESISTORS			
	VR701		JCT1002
OTHER			
	CN121	CONNECTOR	52257−0810

DISPLAY UNIT

Mark	No.	Description	Parts No.
SEMICONDUCTORS			
	IC201		PDG130A
	IC202		S−2914AIF10
	Q202, Q203		XN4601
	Q201		2SA1313
	Q204, Q205		2SC2412K
	D201		TLS262
COILS AND TRANS			
	F201		JTF1036
	T201		JTX1015
SWITCHS AND RELAYS			
	SW202		JSG1017
	SW201		JSH1010
CAPACITORS			
	C205−C207, C212, C213		CCSQCH101J50
	C208, C209		CCSQCH220J50
	C202, C215		CEA470M16LS
	C203, C297, C299		CKSQYB102K50
	C201, C210, C214, C216, C217, C298		CKSQYF104Z50
RESISTORS			
	All Resistors		RS1/10S□□□J
OTHERS			
	CN117	CABLE	JDE1182
	CN255	CABLE	JDE1183
		LED BUSH	CNV−724
		SPACER B	JNV1124
	X201	OCILLATOR	JSS1015
	V201	LCD	JAW1003
	V202	EL	JEL1006

Mark	No.	Description	Parts No.
KEY UNIT			
SEMICONDUCTORS			
	Q230–Q233		XN4601
	D231, D233		MAA3371X
	D230		TLG262
	D232		TLS262
SWITCHS AND RELAYS			
	SW234, SW237, SW238, SW241, SW242, SW244–SW252		JSG1017
	SW230–SW233, SW235, SW236, SW240		MSG3003
CAPACITORS			
	C230–C252		CCSQCH101J50
	C253		CKSQYF104Z50
RESISTORS			
	All Resistors		RS1/10S□□□J
OTHERS			
	CN355	CONNECTOR	52080–1210
		LED BUSH	CNV–724
HEADPHONE UNIT			
SEMICONDUCTORS			
	IC121		M5216L
COILS AND TRANS			
	L121, L122		LCTB1ROK3216
CAPACITORS			
	C133, C134		CEA101M16LL
	C122, C124		CKSQYB103K50
	C135, C136		CEA470M25LL
RESISTORS			
	VR121		JCS1008
	R134, R135		RS1/4S100J
	R125, R126		RS1/4S820J
	Other Resistors		RS1/10S□□□J
OTHERS			
	CN118	CONNECTOR	52008–0510
	JA121	JACK	JKN1020
REM. RECEIVER UNIT			
SEMICONDUCTORS			
	IC101		NJH32H400A
	D102		TLG262
	D101		TLS262
COILS AND TRANS			
	F101		JTF1036
SWITCH			
	SW101		JSH1010
CAPACITORS			
	C102		CEA6R8M50LL
	C101, C103		CKSQYF104Z50
RESISTORS			
	All Resistors		RS1/10S□□□J

Mark	No.	Description	Parts No.
OTHERS			
	CN116	CONNECTOR	JDE1207
		LED BUSH	CNV–724
REC/PLAY RF UNIT			
SEMICONDUCTORS			
	IC351		HA12154MA
	Q351, Q352		2SK932
	Q353, Q354		2SD1328
	Q355, Q356		2SC2412K
COILS AND TRANS			
	L351		ETF9001
CAPACITORS			
	C379		CCSQCH270J50
	C380		CCSQCH330J50
	C374		CCSQCH820J50
	C370		CCSQCH101J50
	C377		CCSQCH121J50
	C373, C378		CCSQCH391J50
	C369		CCSQCH471J50
	C355, C356		CKSQYB472K50
	C351–C354, C360–C362, C365–C368, C371, C372, C375, C376, C381, C382, C390		CKSQYB103K50
	C384, C386, C388, C391		CKSQYB104K25
	C389		CEV4R7M25
	C359		CEV220M6R3
	C383		CEV470M6R3
	C385, C387		CEV101M6R3
	C394		ECX9001
	C357, C358, C363, C364, C392, C393		CKSQYB103K50
RESISTORS			
	VR355, VR356		ECP9001
	VR351, VR353		ECP9002
	VR352, VR354		ECP9003
	Other Resistors		RS1/10S□□□J
OTHERS			
	CN01	CONNECTOR	EKS9003
	CN03	CONNECTOR	EKS9005
MONITOR RF UNIT			
SEMICONDUCTORS			
	IC301		HA12154MA
	Q301, Q302		2SK932
COILS AND TRANS			
	L301		ETF9001
CAPACITORS			
	C341		CCSQCH060C50
	C326		CCSQCH180J50
	C327		CCSQCH330J50
	C320, C328		CCSQCH820J50
	C316		CCSQCH101J50
	C312, C323		CCSQCH151J50
	C319, C324, C325		CCSQCH391J50
	C315		CCSQCH471J50
	C311		CCSQCH122J50
	C305, C306		CKSQYB472K50

Mark	No.	Description	Parts No.
	C301–C304, C307, C308, C310, C313, C314, C317, C318, C321, C322, C329, C330, C338		CKSQYB103K50
	C332, C333, C336, C339		CKSQYB104K25
	C337		CEV4R7M25
	C309		CEV220M6R3
	C331		CEV470M6R3
	C334, C335		CEV101M6R3
	C340		ECX9001
RESISTORS			
	VR301–VR303		ECP9001
	Other Resistors		RS1/10S□□□J
OTHERS			
	CN02	CONNECTOR	EKS9003
	CN04	CONNECTOR	EKS9004

AC ADAPTOR

SEMICONDUCTORS

⚠	Q5		2SC3746
⚠	Q6		2SA1469
⚠	ICP1		ICP–N38
⚠	ICP2		ICP–N25

OTHERS

⚠		FUSE (T1.25A/250V, F1)	JEK1022

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Service Manual

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DIGITAL AUDIO TAPE RECORDER

D-C88

CHAPTER 2

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CHAPTER 2
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2.2 SCHEMATIC AND PCB CONNECTION DIAGRAMS ····· 2−9
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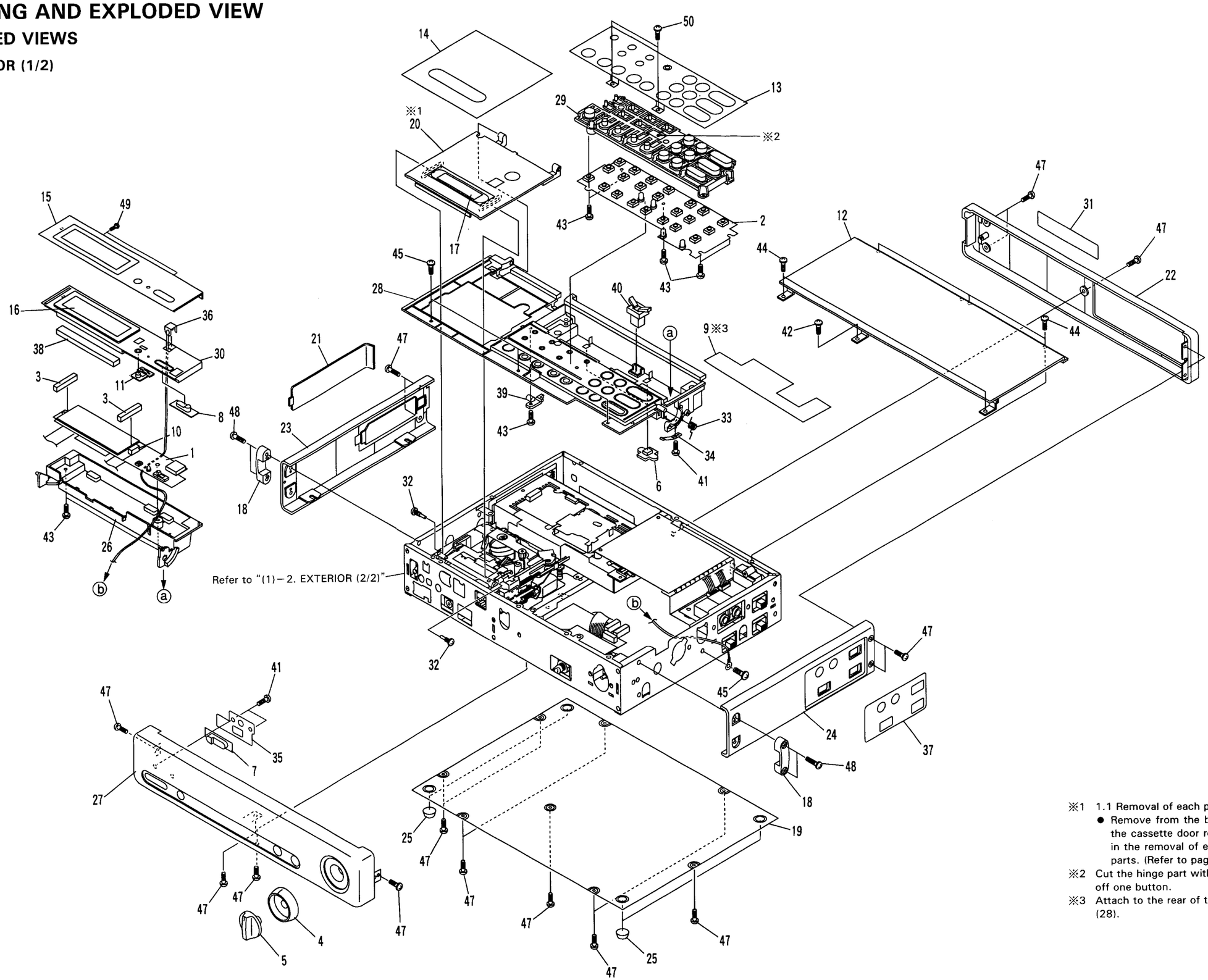
H−DDX MAY 1995 Printed in Japan

2.1 PACKING AND EXPLODED VIEW

(1). EXPLODED VIEWS

(1)－1. EXTERIOR (1/2)

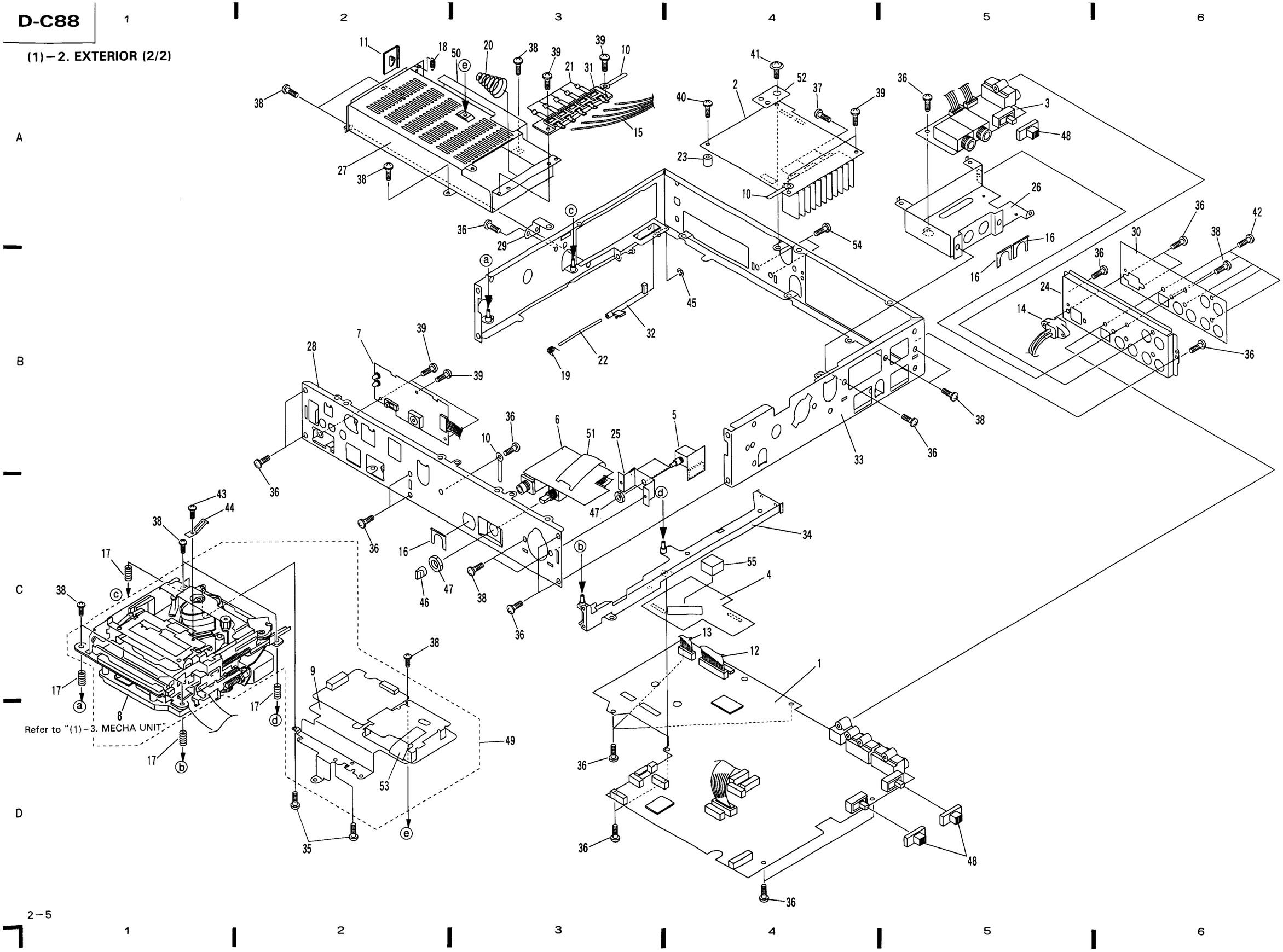


※1 1.1 Removal of each part
- Remove from the body according to the cassette door removal procedure in the removal of externally installed parts. (Refer to page 1－7.)

※2 Cut the hinge part with nippers, and cut off one button.

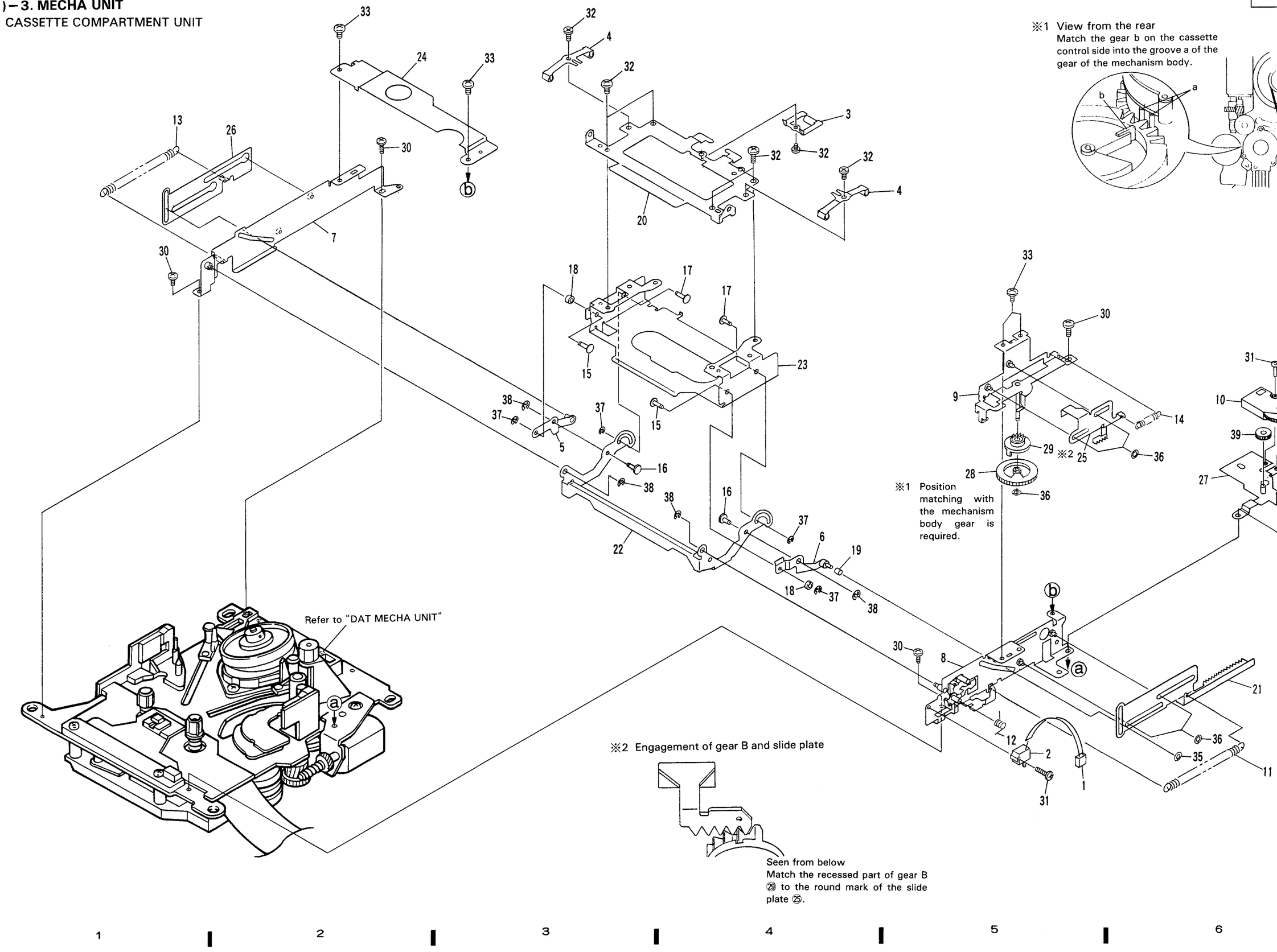
※3 Attach to the rear of the base assembly (28).

(1)–2. EXTERIOR (2/2)

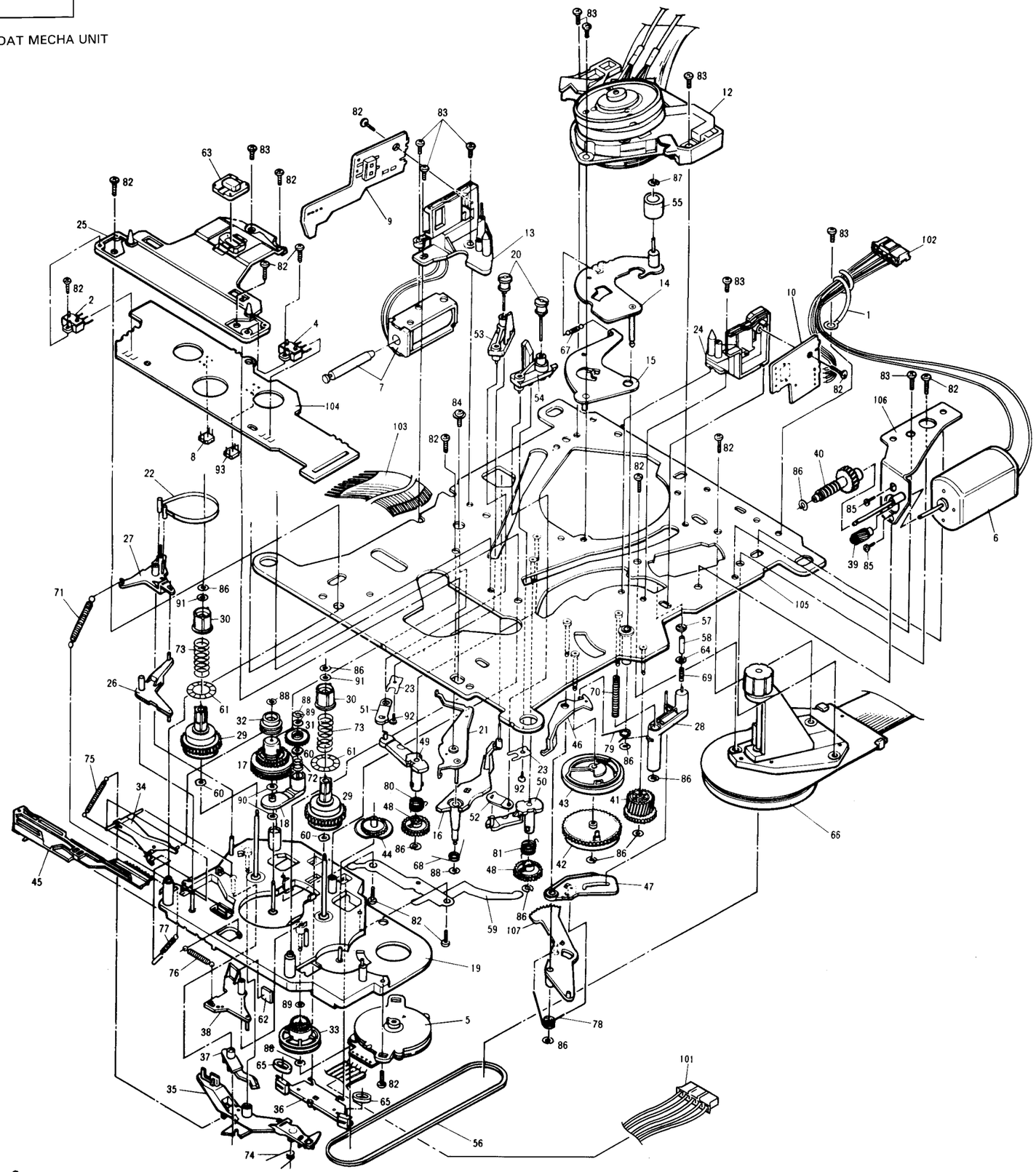


(1)–3. MECHA UNIT

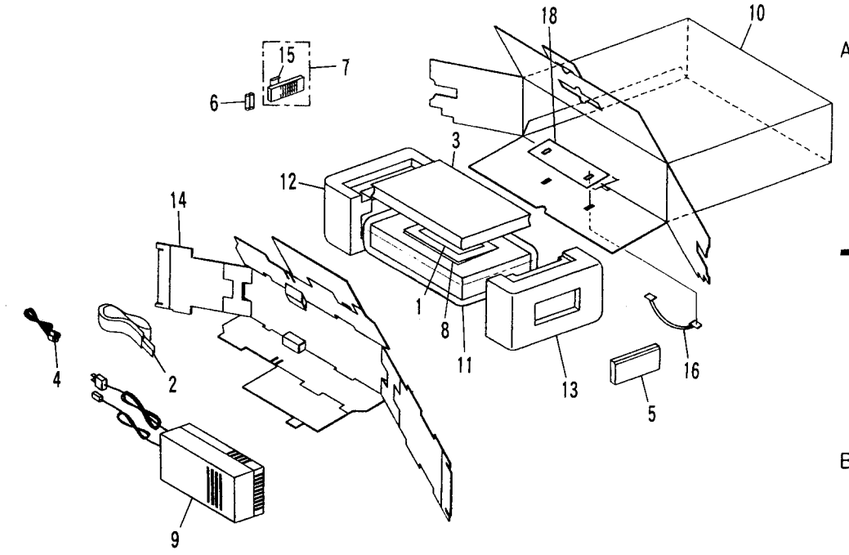
● CASSETTE COMPARTMENT UNIT



● DAT MECHA UNIT

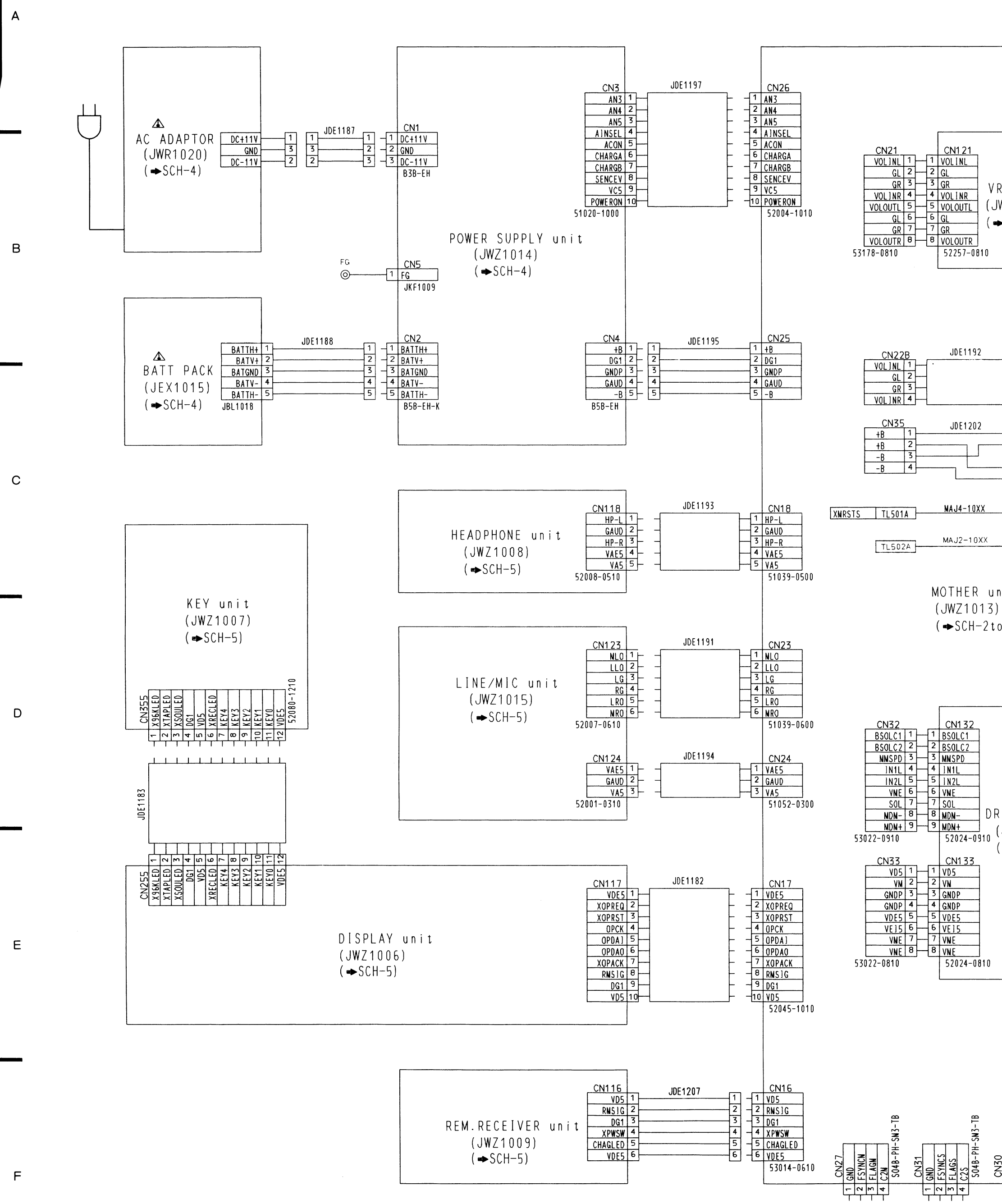


(2). PACKING



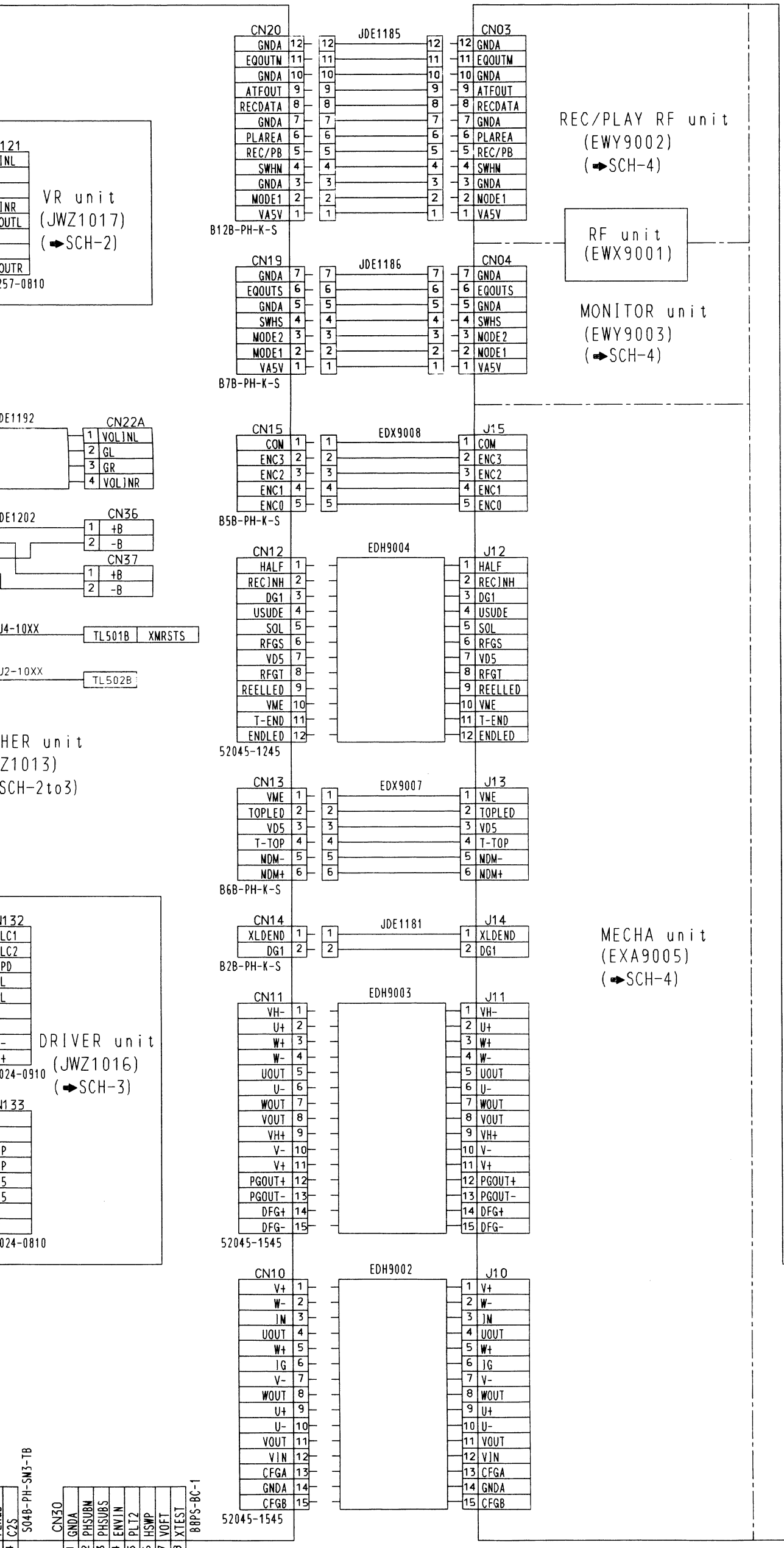
2.2 SCHEMATIC AND PCB CONNECTION

(1). OVERALL SCHEMATIC DIAGRAM



SCH−1 OVERALL SCHEMATIC DIAGRAM

SCH–1



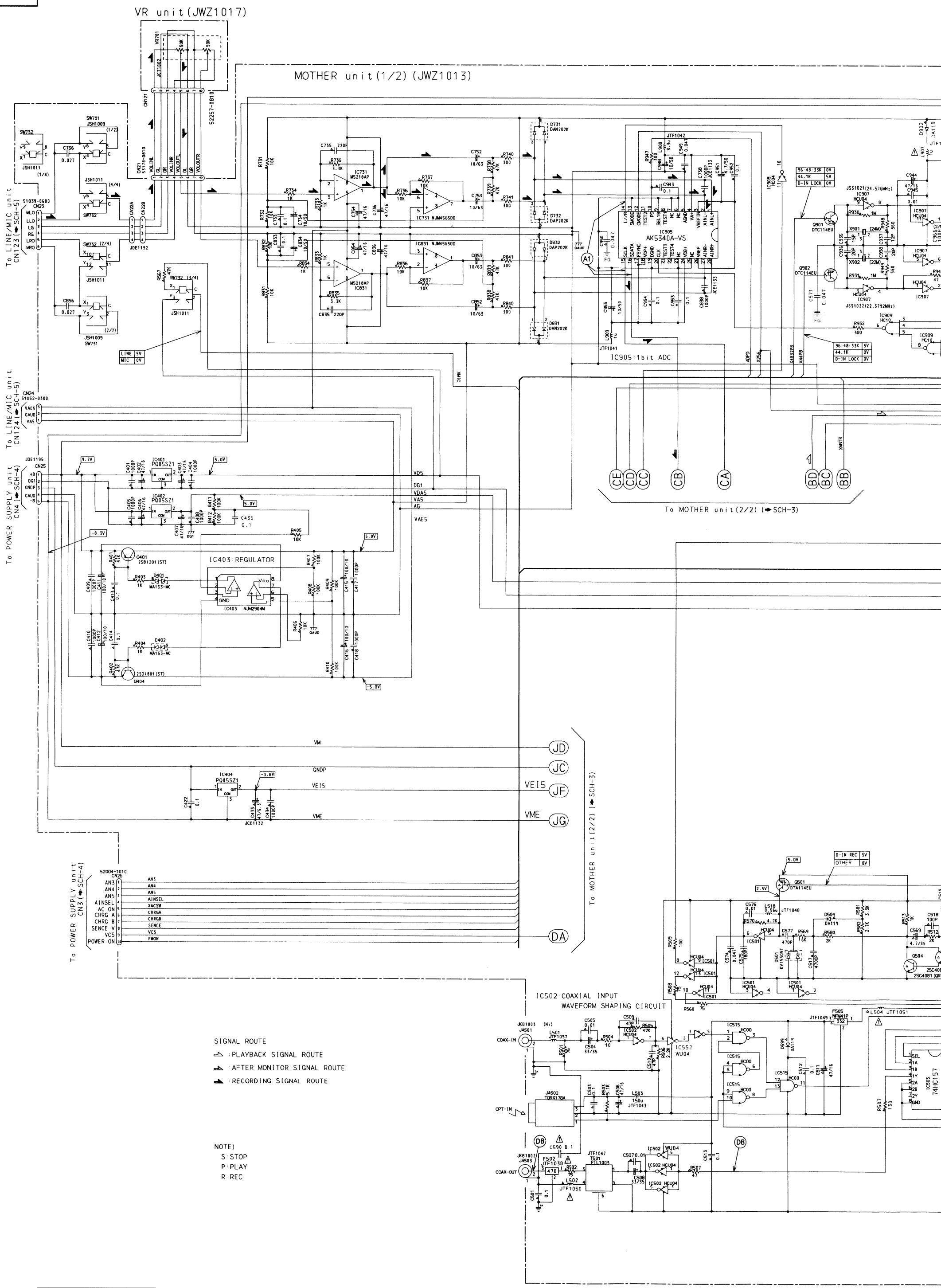
NOTE FOR SCHEMATIC DIAGRAMS

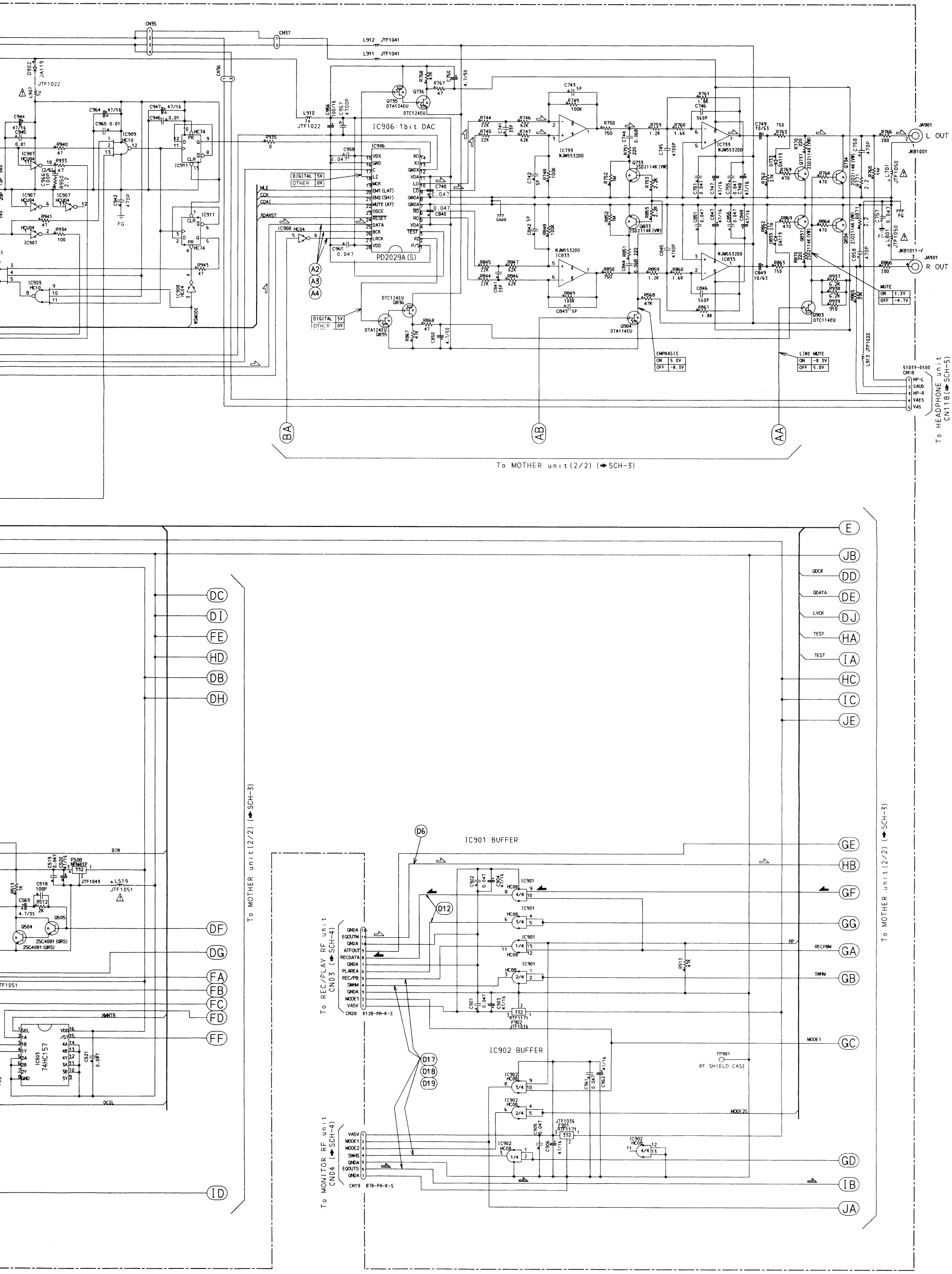
1. **When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".**
2. **Since these are basic circuits, some parts of them or the values of some components may be changed for improvement.**
3. **RESISTORS:**
   Unit: k:kΩ, M:MΩ, or Ω unless otherwise noted.
   Rated power: 1/4W, 1/6W, 1/8W, 1/10W unless otherwise noted.
   Tolerance: (F): ±1%, (G): ±2%, (K): ±10%, (M): ±20% or ±5% unless otherwise noted.
4. **CAPACITORS:**
   Unit: p:pF or μF unless otherwise noted.
   Ratings: capacitor (μF)/ voltage (V) unless otherwise noted.
   Rated voltage: 50V except for electrolytic capacitors.
5. **COILS:**
   Unit: m:mH or μH unless otherwise noted.
6. **VOLTAGE AND CURRENT:**
   ▭ or ← V :
   DC voltage (V) in STOP mode unless otherwise noted.
   ⇦ mA or ← mA :
   DC current in STOP mode unless otherwise noted.
7. **OTHERS:**
   - ⊘ or ⊘ : Adjusting point.
   - ▨ : Measurement point.
   - The ⚠ mark found on some component parts indicates the importance of the safety factor of the parts. Therefore, when replacing, be sure to use parts of identical designation.
8. **SCH–□ ON THE SCHEMATIC DIAGRAM:**
   - SCH–□ indicates the drawing number of the schematic diagram. (SCH stands for schematic diagram.)
9. **SWITCHES** (Underline indicates switch position):

```
MOTHER unit
    SW731 Low Cut Filter (off/on)
    SW732 Analog Input (Mic/Line)

REM.RECEIVER unit
    SW101 Power (Off/On)

DISPLAY unit
    SW201 Key Hold (Off/On)
    SW202 Light (Off/On)

LINE/MIC unit
    SW701 Mic ATT (Off/On)

KEY unit
    SW230 Counter Mode
    SW231 Counter Reset
    SW232 ID Mode Enter
    SW233 ID Mode Select
    SW234 Eject(▲)
    SW235 Peak Reset
    SW236 Auto ID
    SW237 Input Sel
    SW238 Rec Mode
    SW240 TOC Renumber
    SW241 Tape (Moniter)
    SW242 Source (Moniter)
    SW244 Rewind(◀◀)
    SW245 Music Search -(⏮)
    SW246 Rec Mute(⏺)
    SW247 Pause(❚❚)
    SW248 F.F.(▶▶)
    SW249 Stop(■)
    SW250 Music Search +(⏭)
    SW251 Play(▶)
    SW252 Record
```

OVERALL SCHEMATIC DIAGRAM **SCH–1** 2–13

(2). MOTHER UNIT、DRIVER UNIT、VR UNIT





MOTHER UNIT、DRIVER UNIT、VR UNIT (1/2)

SCH−2

The parts mounted on this PCB include all necessary parts for several destinations.
For further information for respective destinations, be sure to check with the schematic diagram.

MOTHER UNIT

To DISPLAY unit CN117

To POWER SUPPLY unit CN3

To REM. RECEIVER unit CN116

To MECHA assy J12

To MECHA assy J15

To MECHA assy J13

To MECHA assy J14

To MECHA assy J10

To MECHA assy J11

DRIVER UNIT

VR UNIT

(A) To LINE/MIC unit CN123

(B) To LINE/MIC unit CN124

(C) To HEADPHONE unit CN118

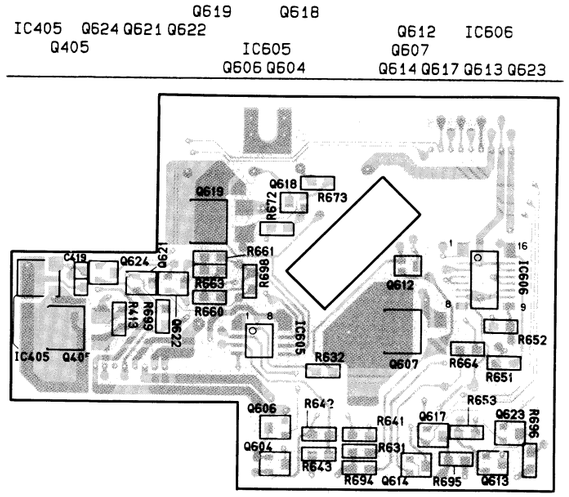
(D) To POWER SUPPLY unit CN4

(E) To REC/PLAY RF unit CN03

(F) To MONITOR RF unit CN04

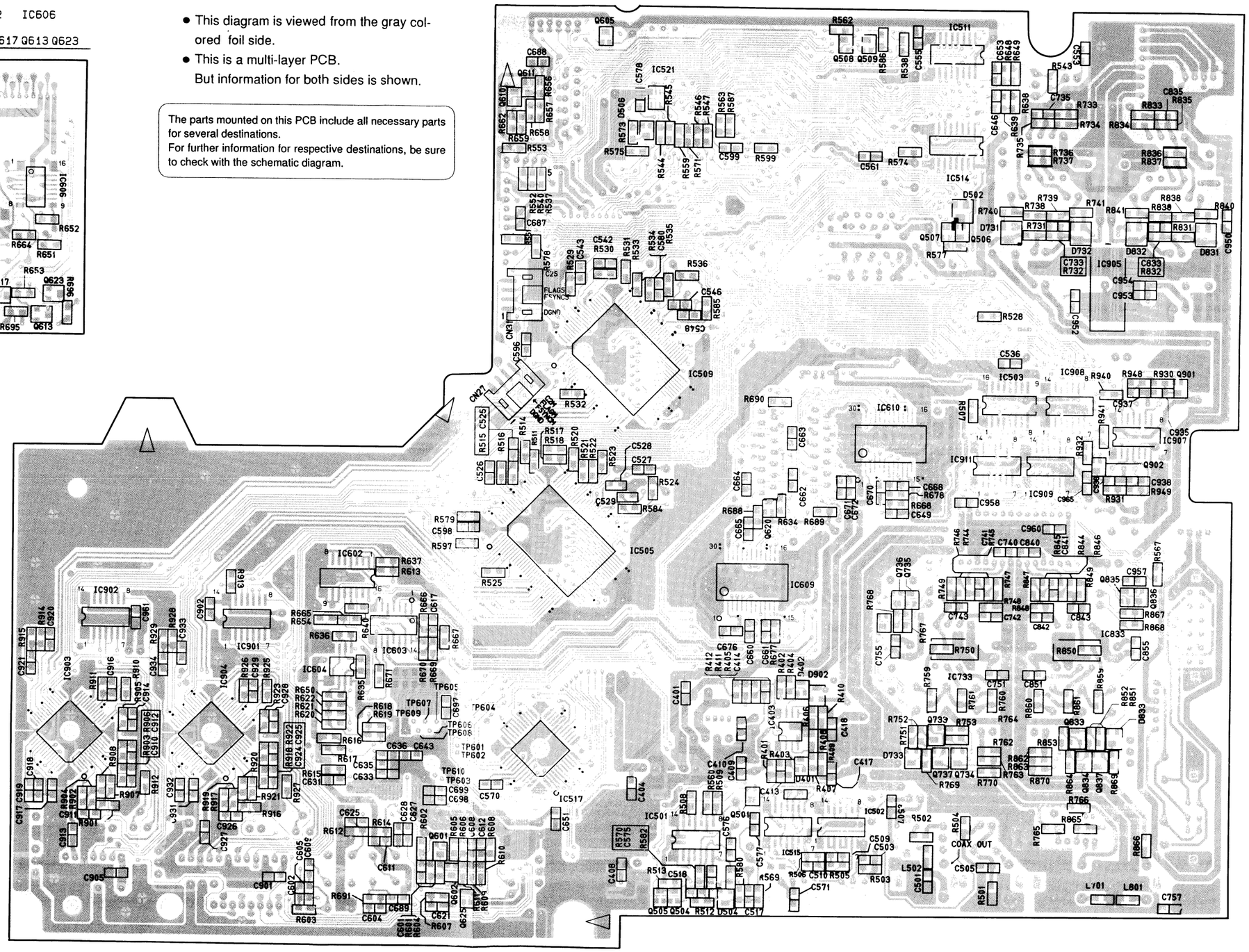
- This diagram is viewed from the pink colored foil side.
- This is a multi-layer PCB.
  But information for both sides is shown.

IC831 IC731 IC502 IC516 IC513 IC512 Q630 Q616 Q608 Q609 VR902 VR901
IC905 IC508 IC404 Q615 IC510 Q603
IC833 IC906 IC733 Q904 Q903 Q404 IC507
Q401 IC401 IC402 IC601



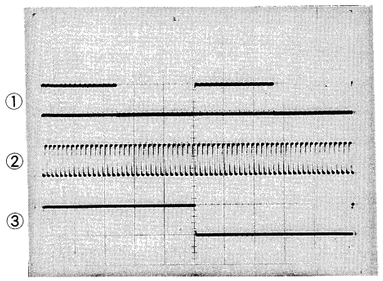
- This diagram is viewed from the gray colored foil side.
- This is a multi-layer PCB.
  But information for both sides is shown.

The parts mounted on this PCB include all necessary parts for several destinations.
For further information for respective destinations, be sure to check with the schematic diagram.



● **Waveforms**

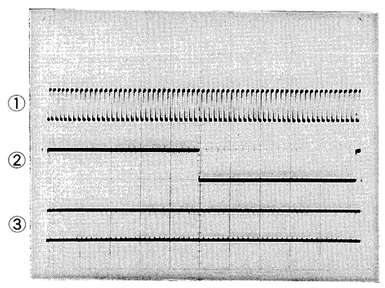
A1 : ADC



Mode: SP (REC)
Input: 1kHz, 0dB
5V/div., 2μS/div.

① SDATA (IC905－Pin16)
② SCLK (IC905－Pin15)
③ L/R (IC905－Pin14)

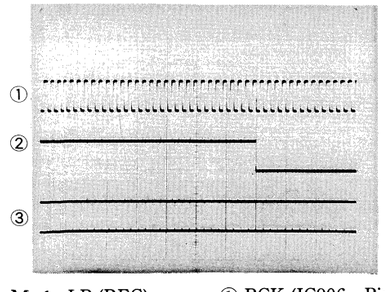
A2 : DAC



Mode: SP (REC)
Input: 1kHz, 0dB
5V/div., 2μS/div.

① BCK (IC906－Pin26)
② LRCK (IC906－Pin27)
③ DATA (IC906－Pin25)

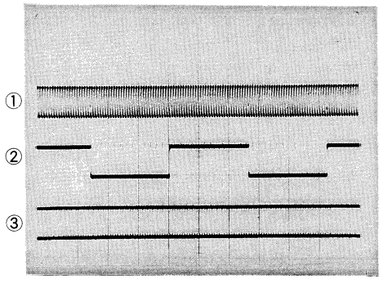
A3 : DAC



Mode: LP (REC)
Input: 1kHz, 0dB
5V/div., 2μS/div.

① BCK (IC906－Pin26)
② LRCK (IC906－Pin27)
③ DATA (IC906－Pin25)

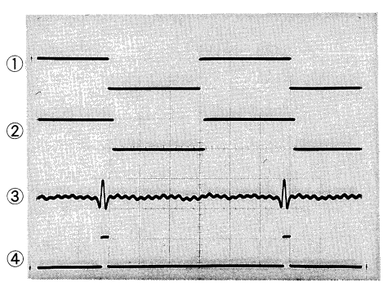
A4 : DAC



Mode: WSP (REC)
Input: 1kHz, 0dB
5V/div., 2μS/div.

① BCK (IC906－Pin26)
② LRCK (IC906－Pin27)
③ DATA (IC906－Pin25)

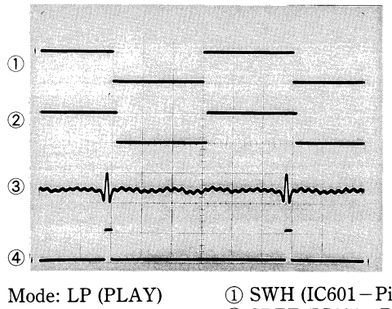
D1



Mode: SP (PLAY)
5V/div., 5mS/div.
(DPG: 0.5V/div.)

① SWH (IC601－Pin70)
② SREF (IC601－Pin71)
③ DPG (IC603－Pin1)
④ TACH (IC601－Pin7)

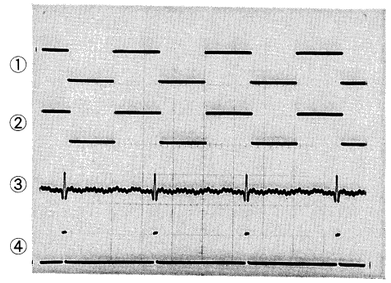
D2



Mode: LP (PLAY)
5V/div., 10mS/div.
(DPG: 0.5V/div.)

① SWH (IC601－Pin70)
② SREF (IC601－Pin71)
③ DPG (IC603－Pin1)
④ TACH (IC601－Pin7)

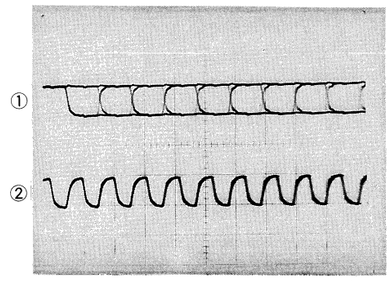
D3



Mode: WSP (PLAY)
5V/div., 5mS/div.
(DPG: 0.5V/div.)

① SWH (IC601－Pin70)
② SREF (IC601－Pin71)
③ DPG (IC603－Pin1)
④ TACH (IC601－Pin7)

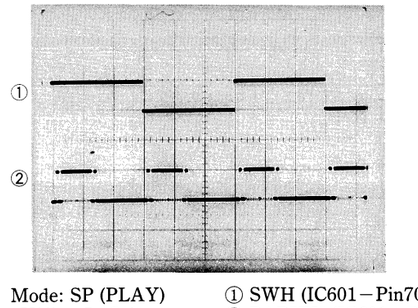
D4



Mode: SP (PLAY)
5V/div., 0.1μS/div.

① PDATA (IC904－Pin52)
② PDCK (IC904－Pin51)

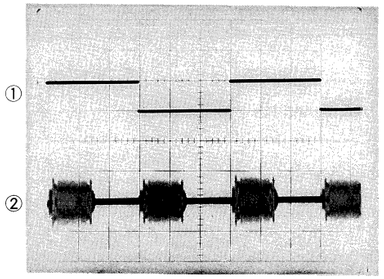
D5



Mode: SP (PLAY)
5V/div., 5mS/div.

① SWH (IC601－Pin70)
② PARITY (IC601－Pin67)

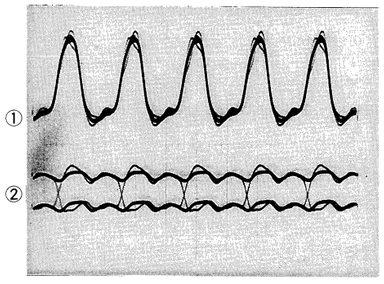
D6



Mode: SP (PLAY)

① HSWP (CN30－Pin6)
5V/div., 5mS/div.
② EQ OUT M (CN20－Pin11)
0.5V/div., 5mS/div.

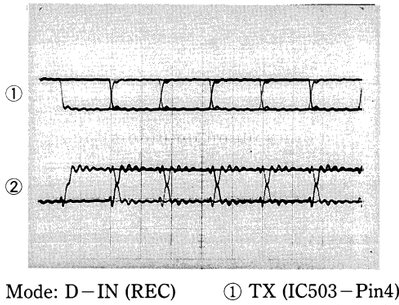
D7



Mode: D－IN (REC)
Fs＝48kHz

① EXCK (IC505－Pin85)
2V/div., 20nS/div.
② RX (IC505－Pin83)
5V/div., 20nS/div.

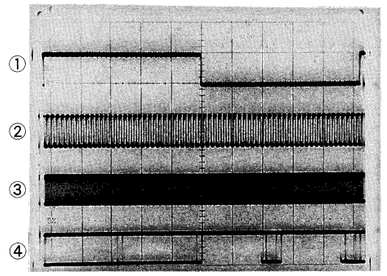
D8



Mode: D－IN (REC)
Fs＝48kHz

① TX (IC503－Pin4)
5V/div., 0.1μS/div.
② COAX OUT (JA503)
0.1V/div., 0.1μS/div.

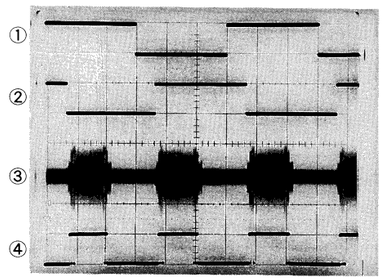
D9



Mode: SP (REC)
Input: No input
5V/div., 2μS/div.

① MPX (IC505－Pin73)
② BCK (IC505－Pin72)
③ FS256 (IC505－Pin70)
④ SOUT (IC505－Pin71)

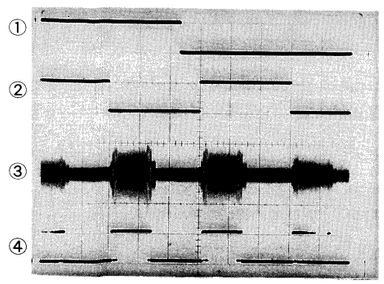
D10



Mode: SP (PLAY)
5V/div., 5mS/div.
(ENVIN: 0.5V/div.)

① FSYNC M (CN27－Pin2)
② HSWP (CN30－Pin6)
③ ENV IN (CN30－Pin4)
④ ENVOUT (IC601－Pin64)

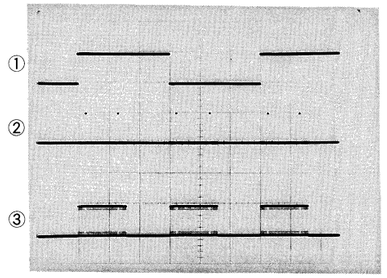
D11



Mode: LP (PLAY)
5V/div., 5mS/div.
(ENVIN: 0.5V/div.)

① FSYNC M (CN27－Pin2)
② HSWP (CN30－Pin6)
③ ENV IN (CN30－Pin4)
④ ENVOUT (IC601－Pin64)

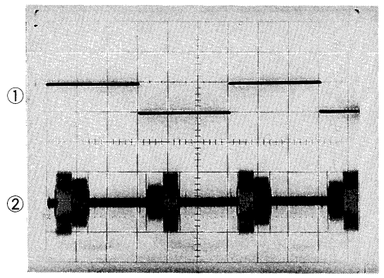
D12



Mode: SP (REC)
5V/div., 5mS/div.

① HSWP (CN30－Pin6)
② PLAREA (CN20－Pin6)
③ RECDATA (CN20－Pin8)

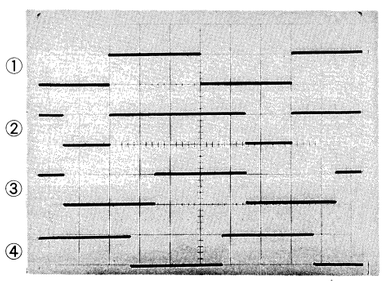
D13



Mode: SP (PLAY)
Test Tape: SDA－102

① HSWP (CN30－Pin6)
5V/div., 5mS/div.
② PLT2 (CN30－Pin5)
0.1V/div., 5mS/div.

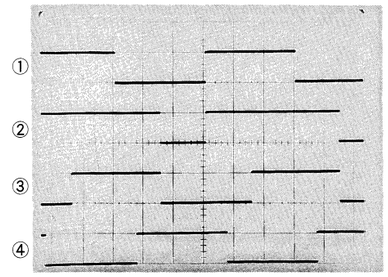
D14



Mode: SP (REC)
5V/div., 5mS/div.

① FSYNC M (CN27－Pin2)
② STRG (IC509－Pin93)
③ FSYNC S (CN31－Pin2)
④ HSWP (CN30－Pin6)

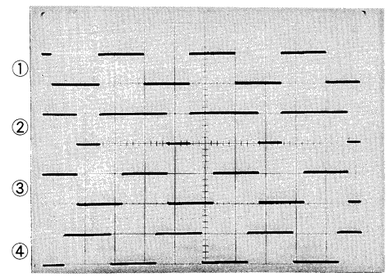
D15



Mode: LP (REC)
5V/div., 10mS/div.

① FSYNC M (CN27－Pin2)
② STRG (IC509－Pin93)
③ FSYNC S (CN31－Pin2)
④ HSWP (CN30－Pin6)

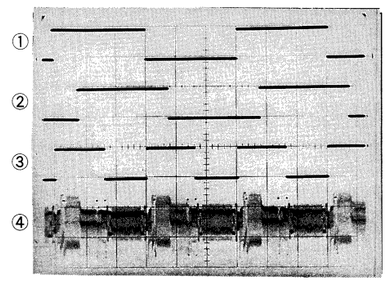
D16



Mode: WSP (REC)
5V/div., 5mS/div.

① FSYNC M (CN27－Pin2)
② STRG (IC509－Pin93)
③ FSYNC S (CN31－Pin2)
④ HSWP (CN30－Pin6)

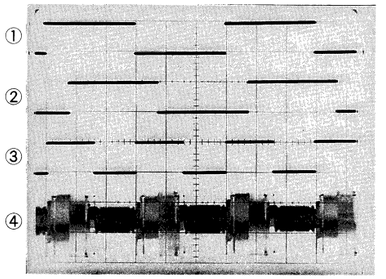
D17



Mode: SP (REC)
5V/div., 5mS/div.
(EQ OUT S: 1V/div.)

① SWHM (CN20－Pin4)
② SWHS (CN19－Pin4)
③ REC/PB (CN20－Pin5)
④ EQ OUT S(CN19－Pin6)

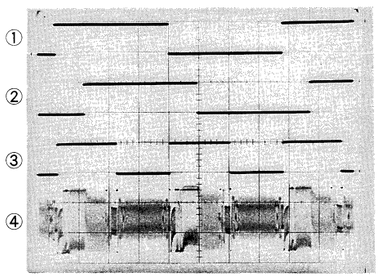
D18



Mode: LP (REC)
5V/div., 10mS/div.
(EQ OUT S: 1V/div.)

① SWHM (CN20－Pin4)
② SWHS (CN19－Pin4)
③ REC/PB (CN20－Pin5)
④ EQ OUT S(CN19－Pin6)

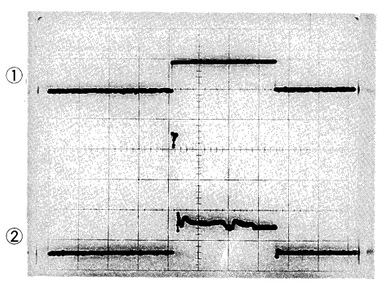
D19



Mode: WSP (REC)
5V/div., 2mS/div.
(EQ OUT S: 1V/div.)

① SWHM (CN20－Pin4)
② SWHS (CN19－Pin4)
③ REC/PB (CN20－Pin5)
④ EQ OUT S(CN19－Pin6)

C1



Mode: Solenoid ON
(PLAY BUTTON ON)

① BSOLON (CN132－Pin1)
5V/div., 0.1S/div.
② SOL (CN132－Pin7)
2V/div., 0.1S/div.
(One div. above the center line is GND level.)

The waveforms C2 and C3 are shown on page 2－28 and page 2－39.

MOTHER unit (2/2) (JWZ1013)

To MOTHER unit (1/2) (➡ SCH-2)

To MOTHER unit (1/2) (➡ SCH-2)

IC517 : MASTER/SLAVE GATE ARRAY

IC517 PDB083A

IC505 HD49226AFS

IC505 : RECORD/PLAYBACK SIGNAL-PROSESSING LSI (MASTER)

IC507 HM62256ALFP-12T

IC507 : RAM

IC509 HD49226AFS

IC505 : PLAYBACK SIGNAL-PROSESSING LSI (SLAVE)

IC904 HD49229

IC904 : DATA STROBE (MASTER)

IC903 HD49229

IC903 : DATA STROBE (SLABE)

IC601 HD49228FS

SERVO CONTROL

IC602 TC4053BF

IC603 NJM2902M

IC604 NJM2904M

VE15

VME

SCH-3

MOTHER UNIT、DRIVER UNIT、VR UNIT (2/2)

SCH-3

SIGNAL ROUTE
- PLAYBACK SIGNAL ROUTE
- AFTER MONITOR SIGNAL ROUTE
- RECORDING SIGNAL ROUTE
- (CD) CAPSTAN MOTOR DRIVE SIGNAL
- (CC) CAPSTAN MOTOR CONTROL SIGNAL
- (DD) DRUM MOTOR DRIVE SIGNAL
- (DC) DRUM MOTOR CONTROL SIGNAL
- (MD) MODE MOTOR DRIVE SIGNAL
- (MC) MODE MOTOR CONTROL SIGNAL
- (RC) RELL CONTROL SIGNAL

NOTE)
S : STOP
P : PLAY
R : REC

ER/SLAVE ARRAY

IC510 : RAM HM62256ALFP-12T

IC520 : RESET PST5230

IC512 PDG131A

IC511 74HC153

IC514 74HC153

IC513 74HC595

IC516 HC32

IC521 4581S

IC609 : DRUM MOTOR DRIVER LB1687M

IC610 : CAPSTAN MOTOR DRIVER LB1687M

IC606 : MODE MOTOR DRIVER

IC605 NJM2904M

IC604 NJM2904M

Q608, Q611 : REEL FG AMP

Q605, Q616, Q630 : T-TOP, END DETECT LED DRIVER

DRIVER unit (JWZ1016)

Q619 : SOLENOID ON/OFF

To DISPLAY unit CN117 (➡ SCH-5)

To REM : RECEIVER unit CN116 (➡ SCH-5)

To MECHA assy J15 (➡ SCH-4)

To MECHA assy J14 (➡ SCH-4)

To MECHA assy J13 (➡ SCH-4)

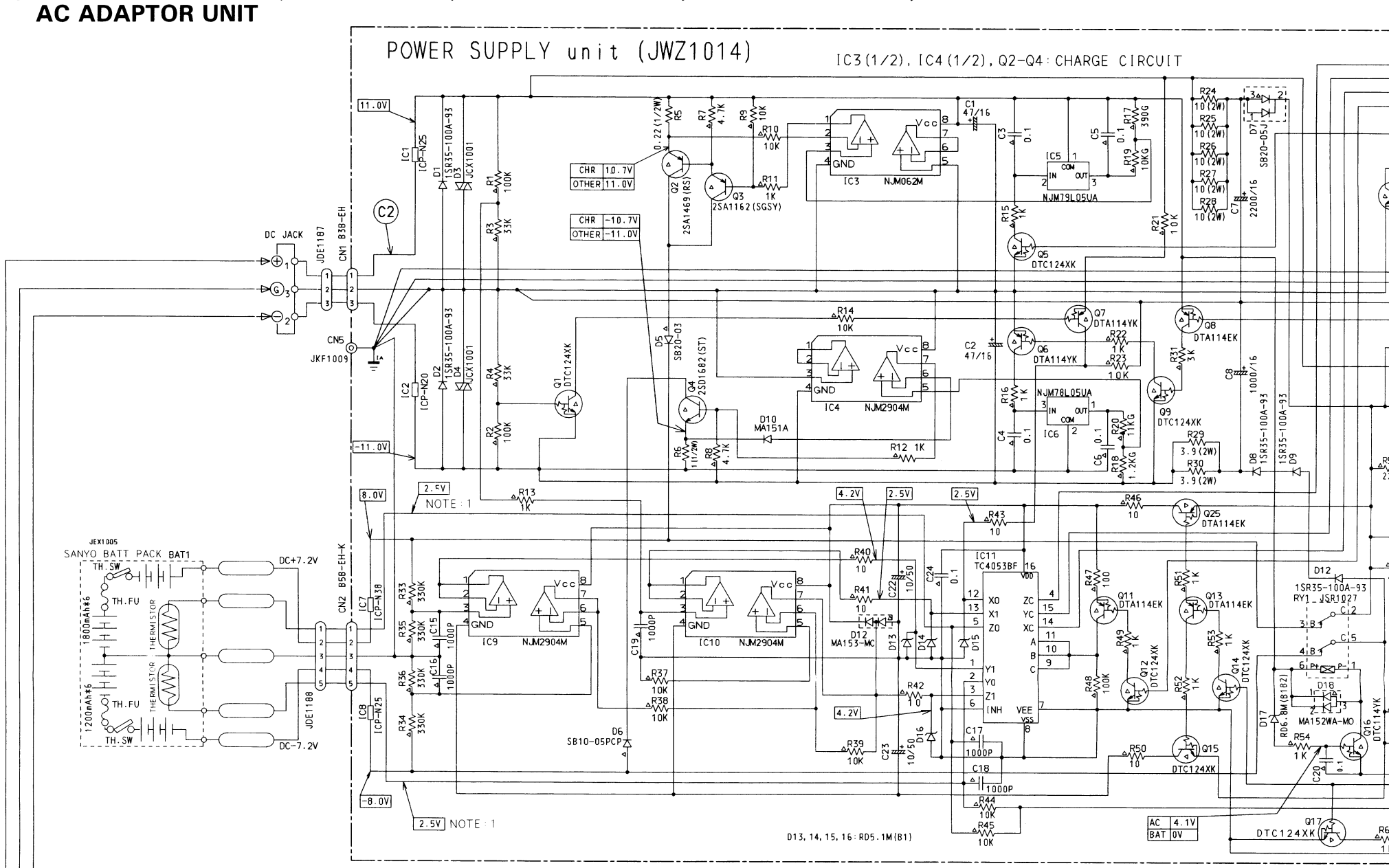
To MECHA assy J12 (➡ SCH-4)

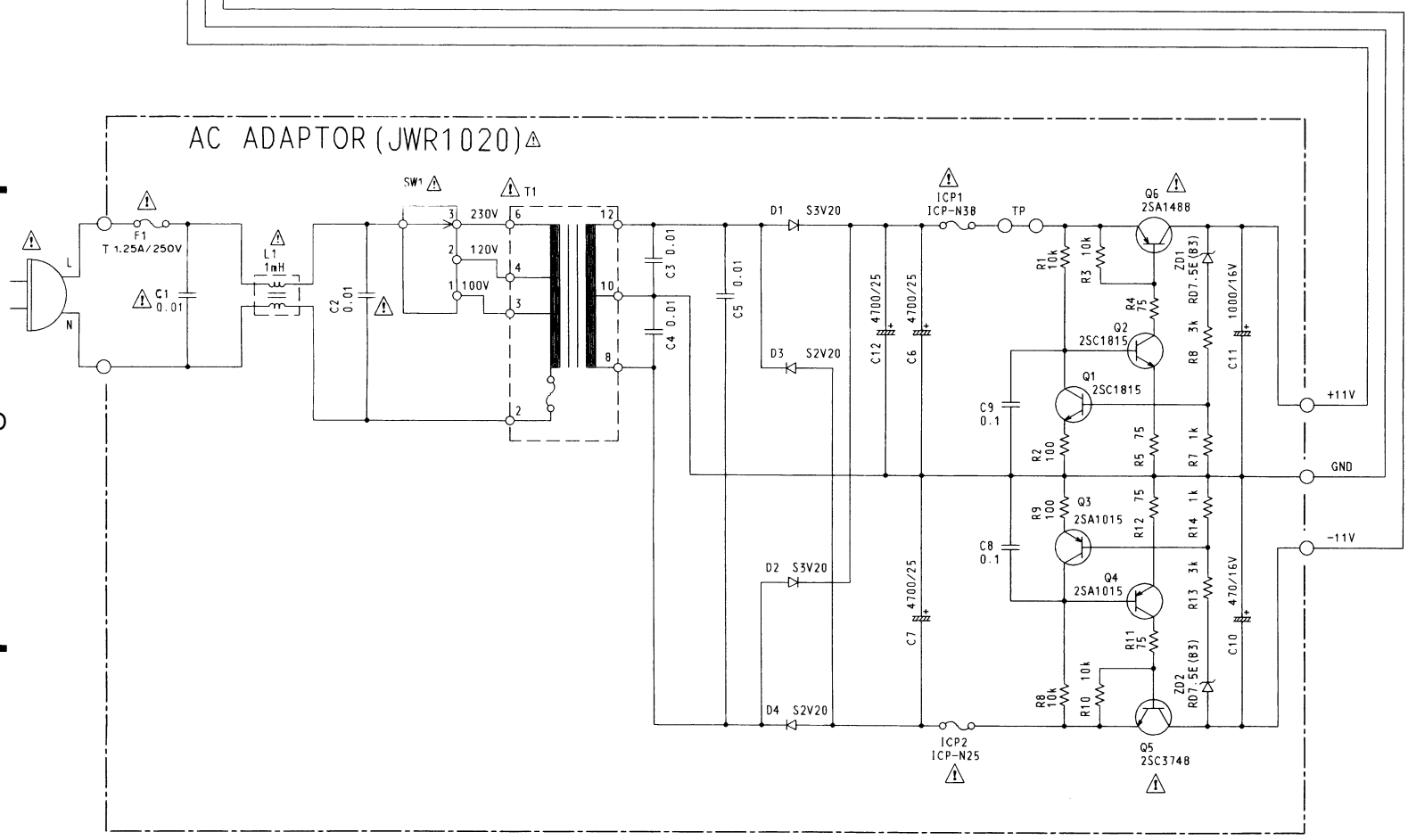
To MECHA assy J11 (➡ SCH-4)

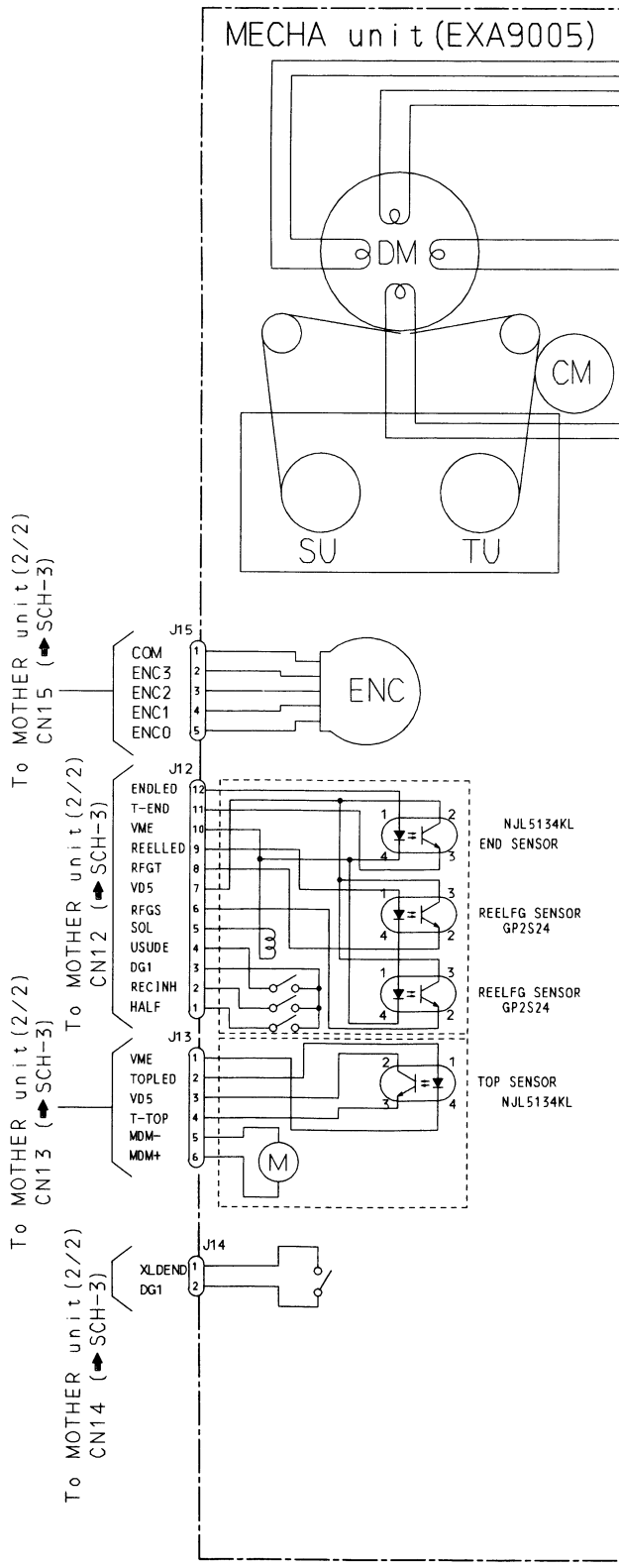
To MECHA assy J10 (➡ SCH-4)

TO MOTHER

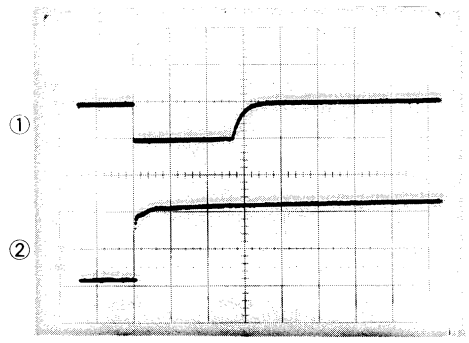
(3). POWER SUPPLY UNIT、MECHA UNIT、REC/PLAY RF UNIT、MONITOR RF UNIT、AC ADAPTOR UNIT







C2



Mode: Body side AC adapter; At the time of socket insertion (during battery operation)

① AC ON (CN3－Pin5)
② +11V (CN1－Pin1)

5V/div., 2mS/div.

NOTE : 1 When the battery temperature is 25 ℃

AC : At the time of AC adaptor operation
BAT : At the time of battery operation
(In fully charged condition)
CHR : At the time of battery charging

POWER SUPPLY UNIT、MECHA UNIT、
REC/PLAY RF UNIT、MONITOR RF UNIT、
AC ADAPTOR UNIT

SCH−4

PCB – 2

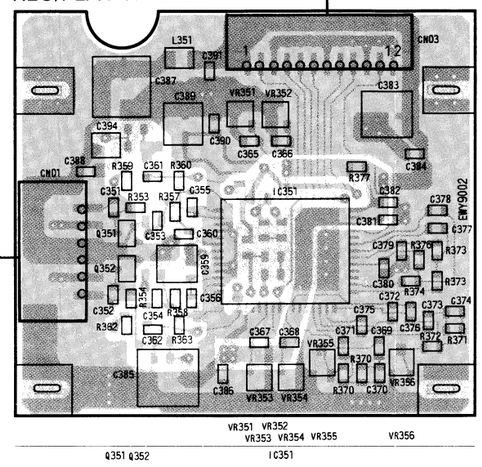
- This diagram is viewed from the pink colored foil side.
- This is a multi-layer PCB.
  But information for both sides is shown.

The parts mounted on this PCB include all necessary parts for several destinations.
For further information for respective destinations, be sure to check with the schematic diagram.

RF UNIT

To MOTHER unit CN20

REC/PLAY RF UNIT



DM

CM

SU REEL

TU REEL

DRUM MOTOR

J11

CN11

CAPSTAN MOTOR

J10

CN10

To MOTHER unit

Photo Reflector assy (EXX9002)

Photo Reflector assy (EXX9001)

POWER MOTOR

CN13

J13

Reel Sensor Board

CN12

J12

J14

S201

CN14

J15

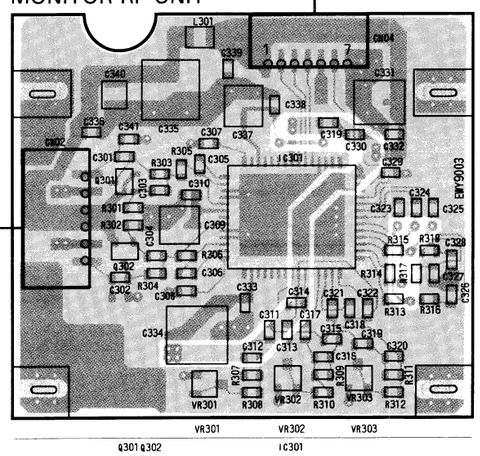
ENC

CN15

- This diagram is viewed from the mounted parts side.

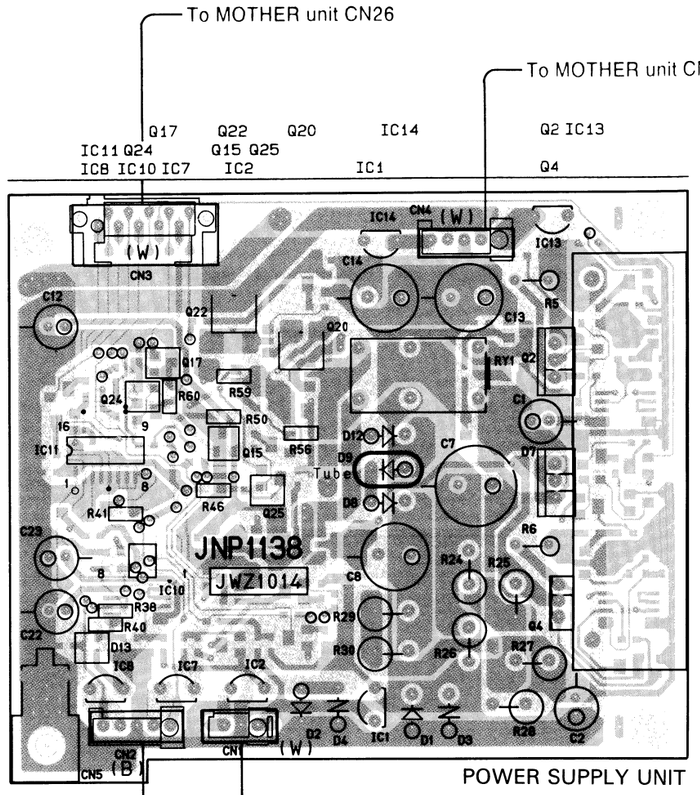
To MOTHER unit CN19

MONITOR RF UNIT



To MOTHER unit CN26

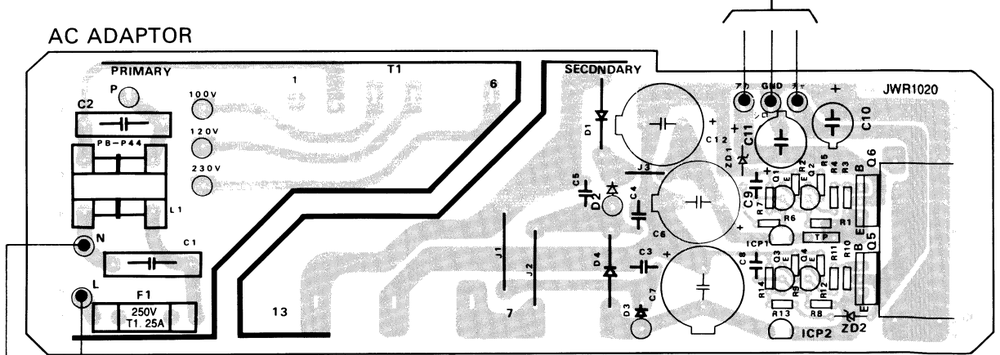
To MOTHER unit CN25



POWER SUPPLY UNIT

To BATT PACK

AC ADAPTOR

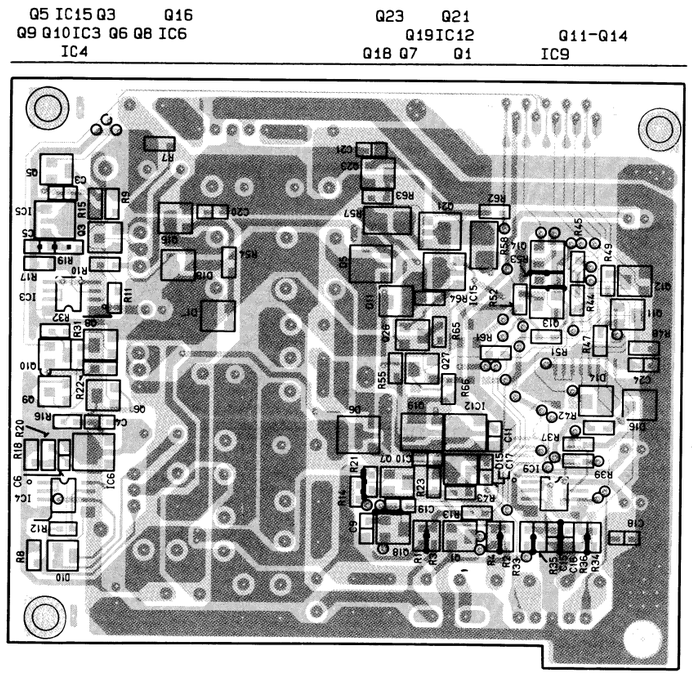


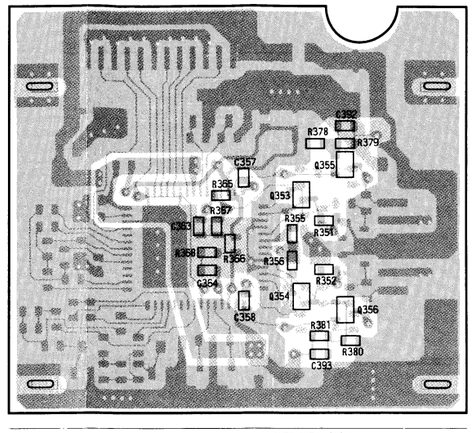
To AC CORD

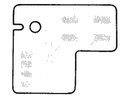
- This diagram is viewed from the mounted parts side.

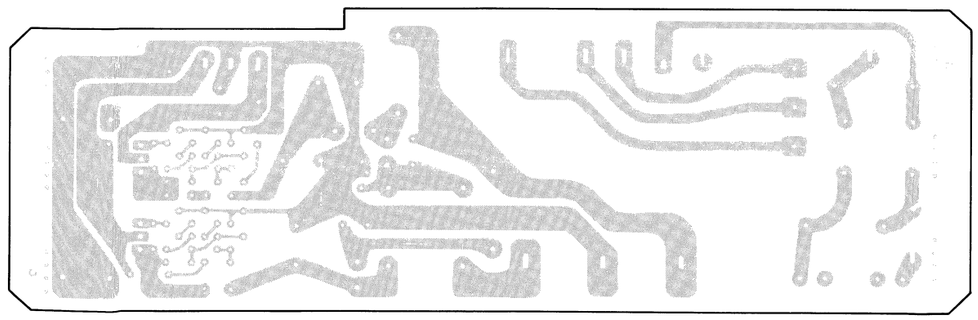
- This diagram is viewed from the gray colored foil side.
- This is a multi-layer PCB.
  But information for both sides is shown.

The parts mounted on this PCB include all necessary parts for several destinations.
For further information for respective destinations, be sure to check with the schematic diagram.

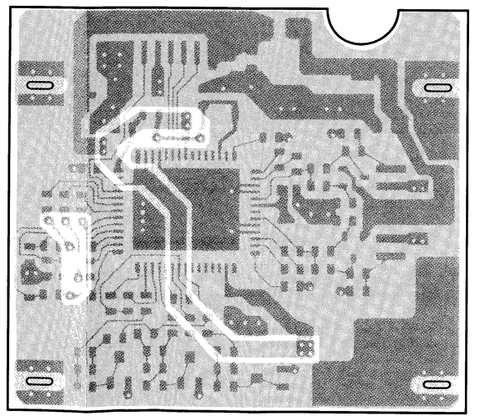


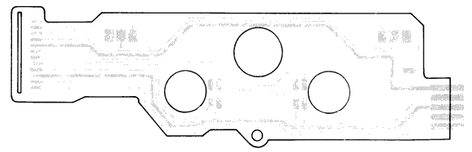






- This diagram is viewed from the foil side.

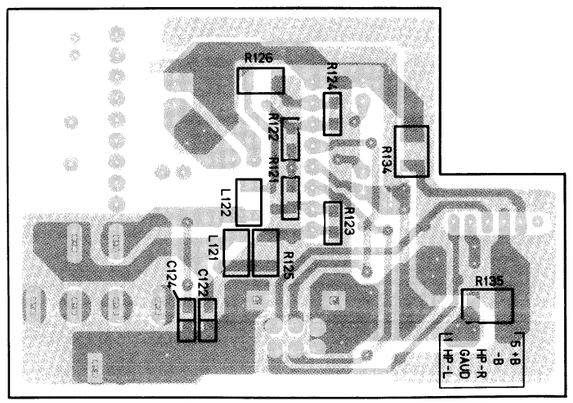


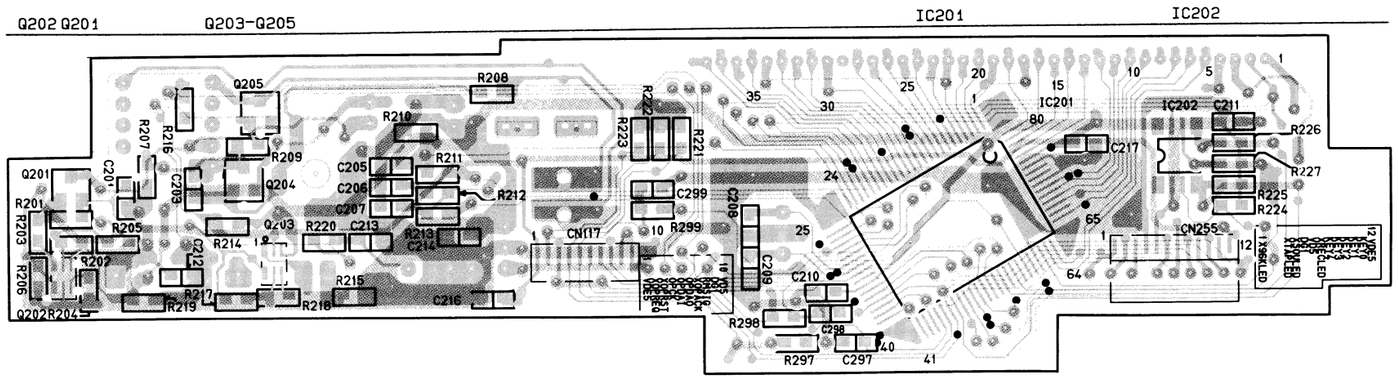


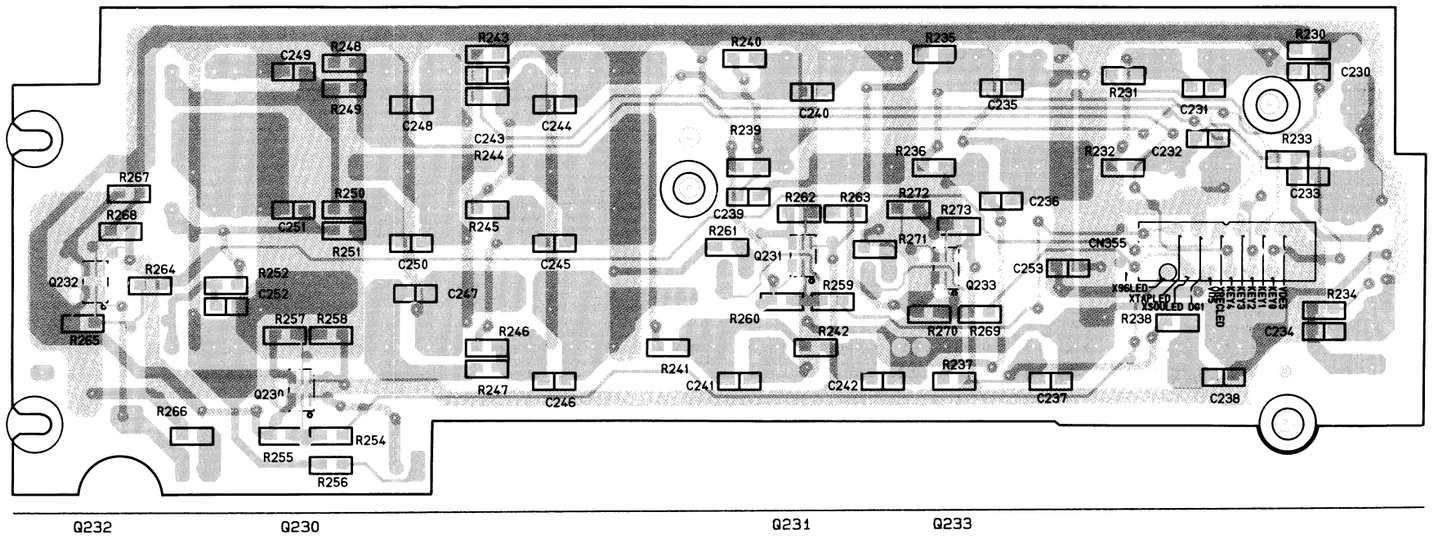
- This diagram is viewed from the foil side.

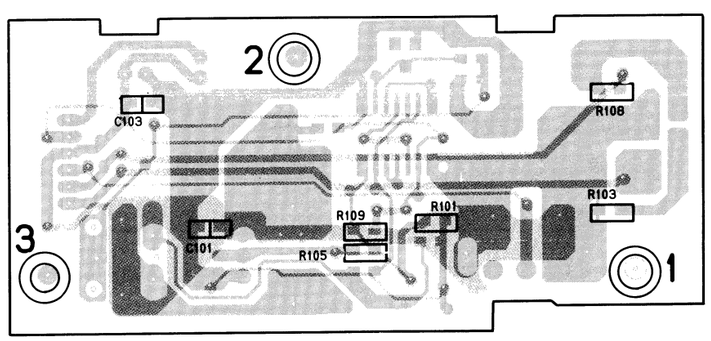
- This diagram is viewed from the gray colored foil side.
- This is a multi-layer PCB.
  But information for both sides is shown.

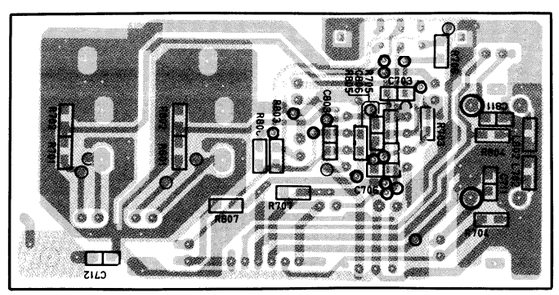
The parts mounted on this PCB include all necessary parts for several destinations.
For further information for respective destinations, be sure to check with the schematic diagram.











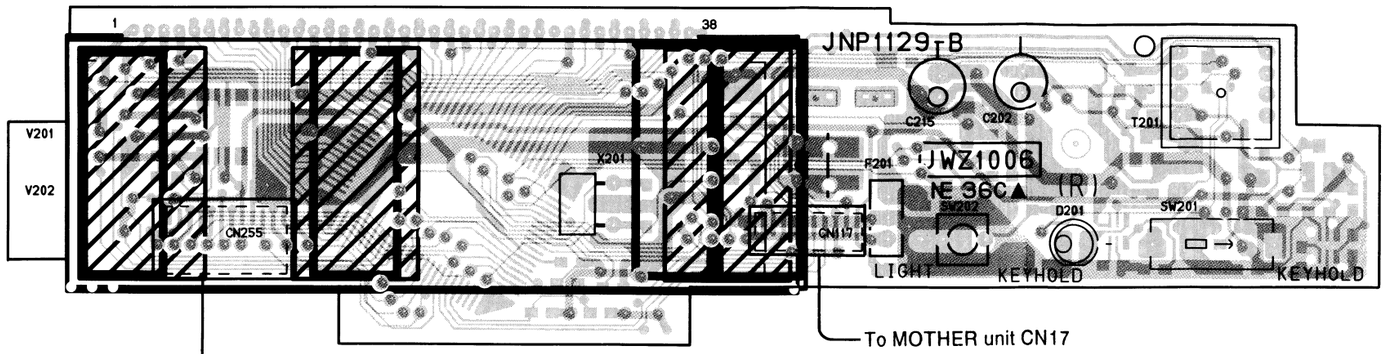
(4). LINE/MIC UNIT、DISPLAY UNIT、KEY UNIT、REM RECEIVER UNIT、HEADPHONE UNIT

- This diagram is viewed from the pink colored foil side.
- This is a multi-layer PCB.
  But information for both sides is shown.

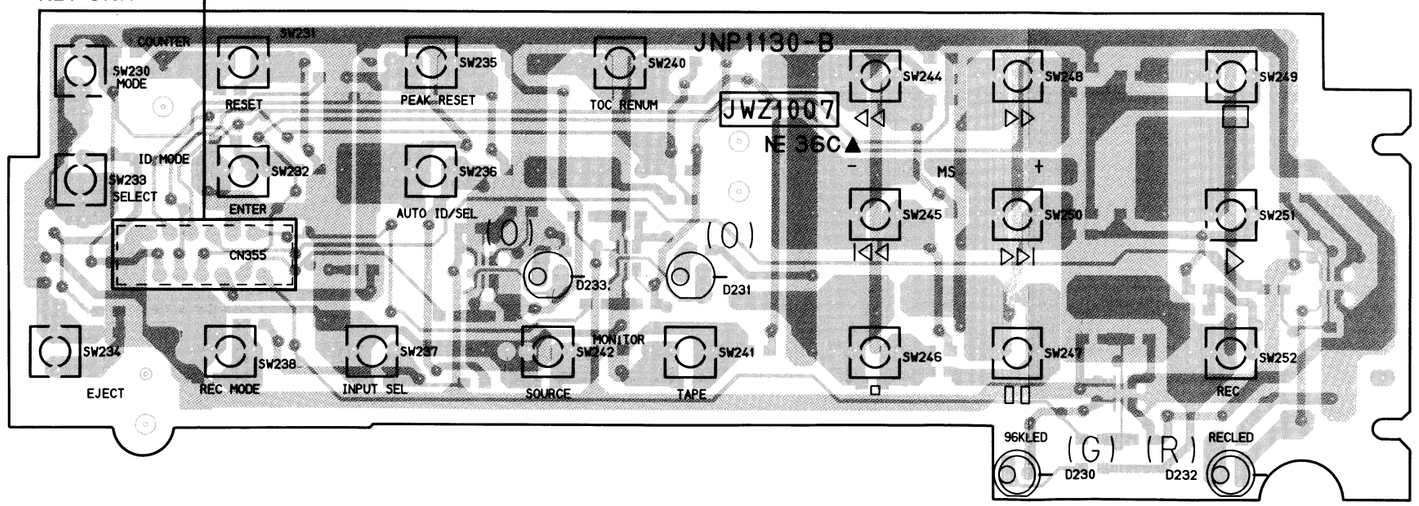
The parts mounted on this PCB include all necessary parts for several destinations.
For further information for respective destinations, be sure to check with the schematic diagram.

PCB－3

DISPLAY UNIT

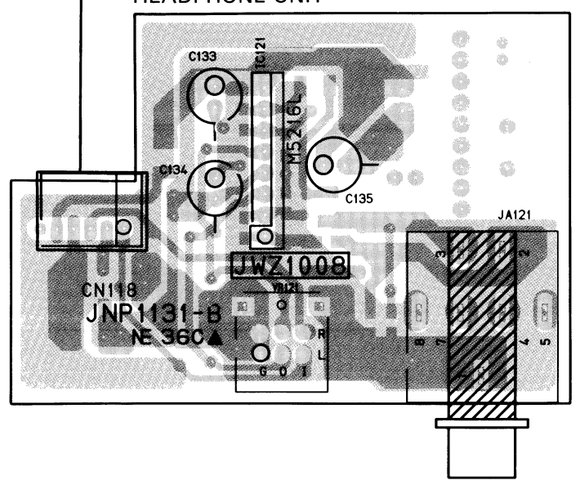


KEY UNIT

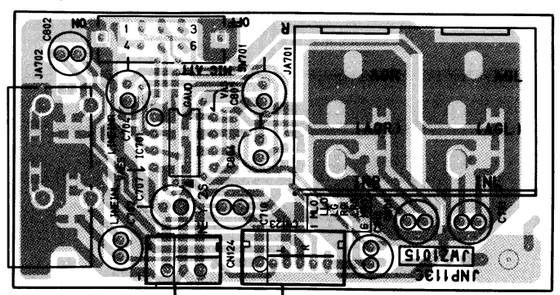


To MOTHER unit CN18

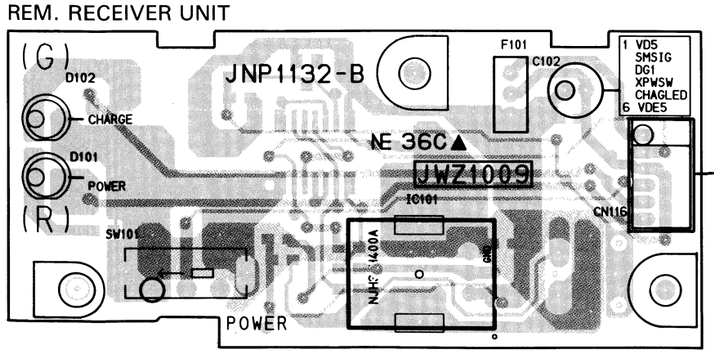
HEADPHONE UNIT



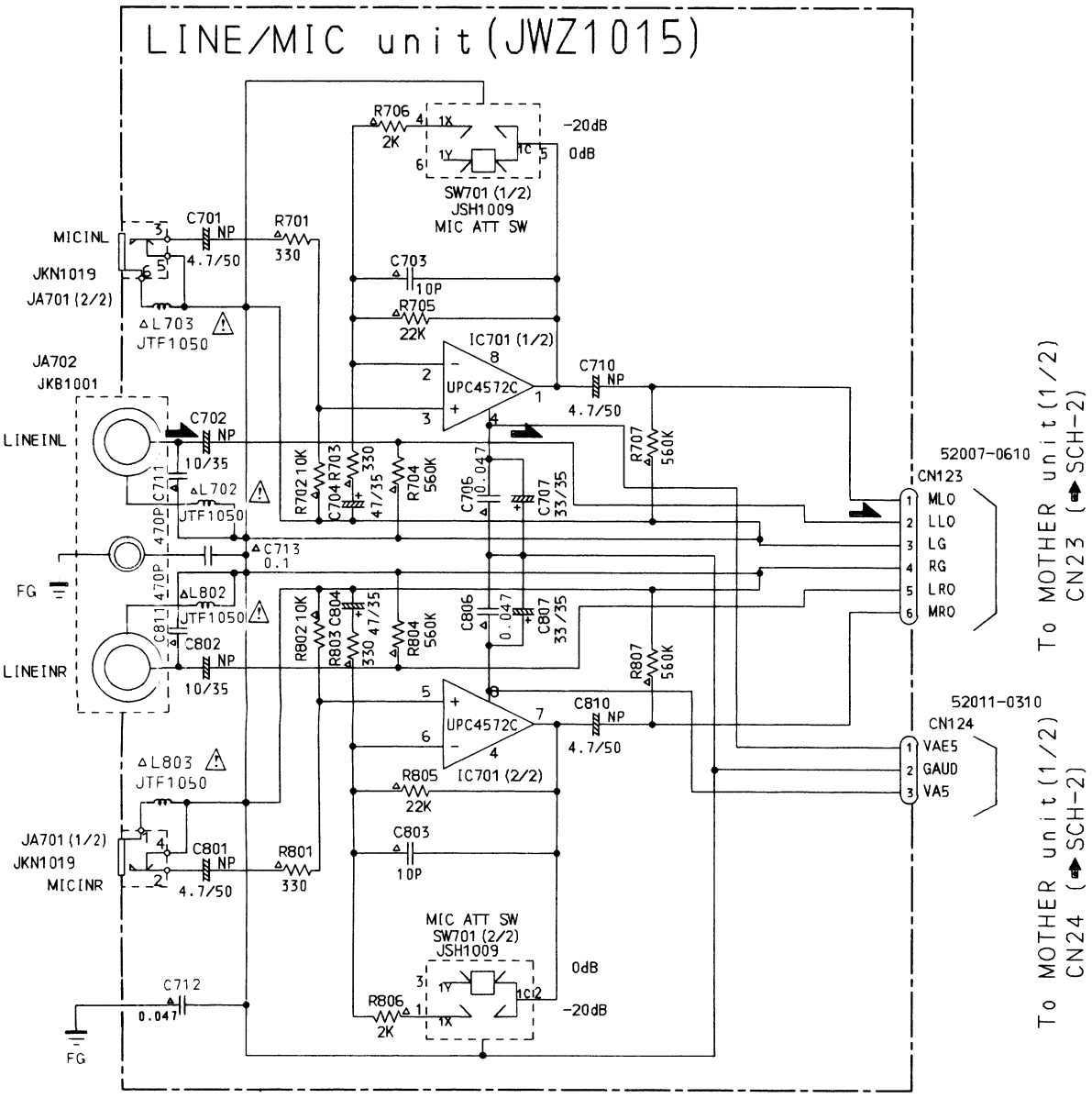
LINE/MIC UNIT



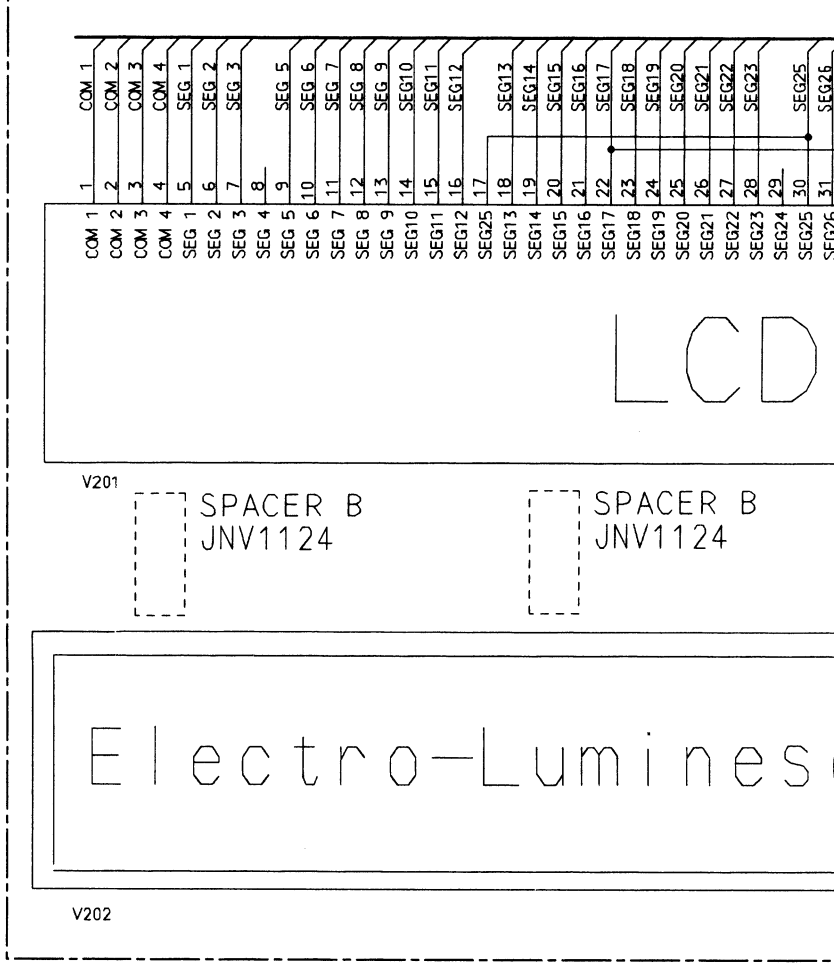
REM. RECEIVER UNIT



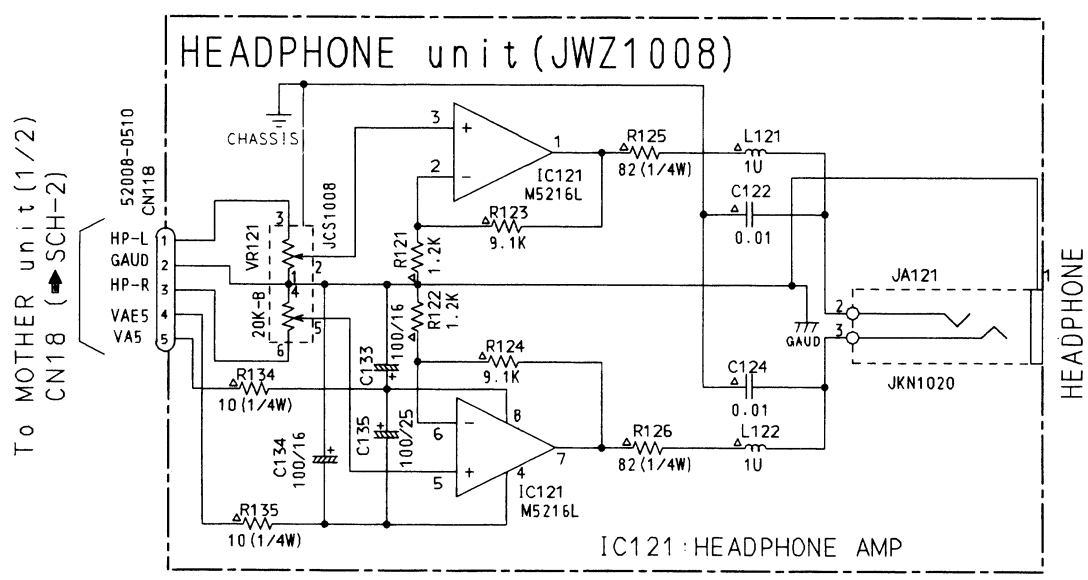
LINE/MIC unit (JWZ1015)



DISPLAY unit (JWZ1006)



HEADPHONE unit (JWZ1008)



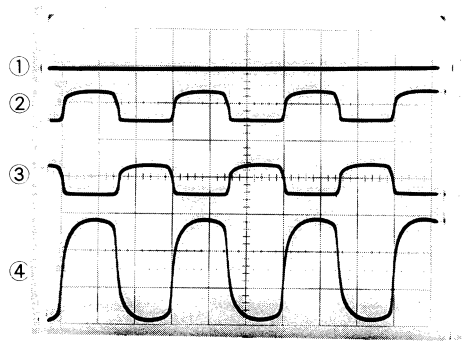
CNT MODE	0V
CNT RESET	1.0V
ID ENTER	2.0V
ID SEL	2.9V
EJECT	3.8V

PEAK RST	0
AUTO ID	1
INP SEL	2
REC MODE	2

SIGNAL ROUTE

➡ : RECORDING SIGNAL ROUTE

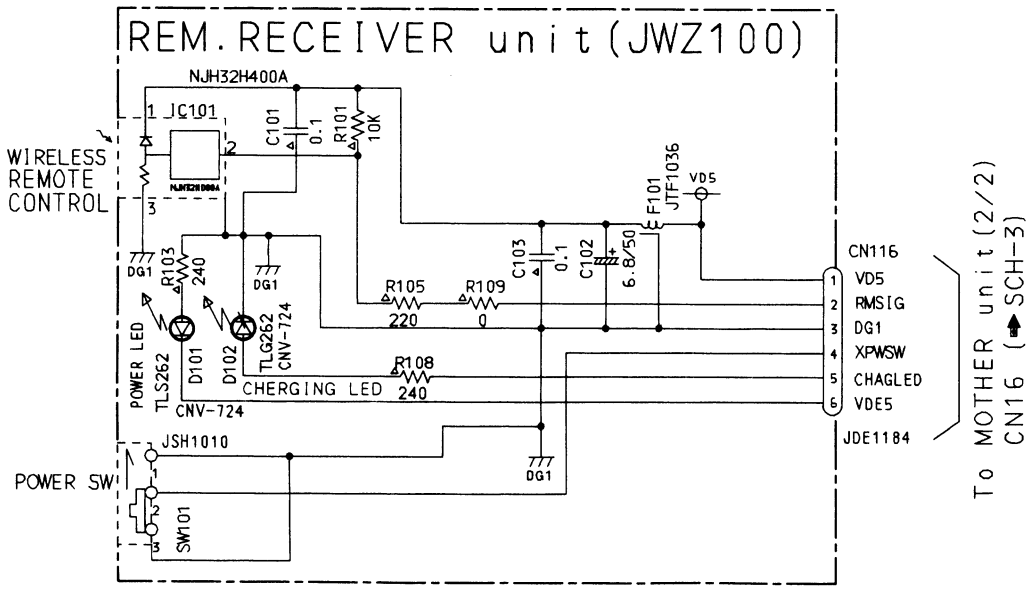
C3



Mode: EL ON

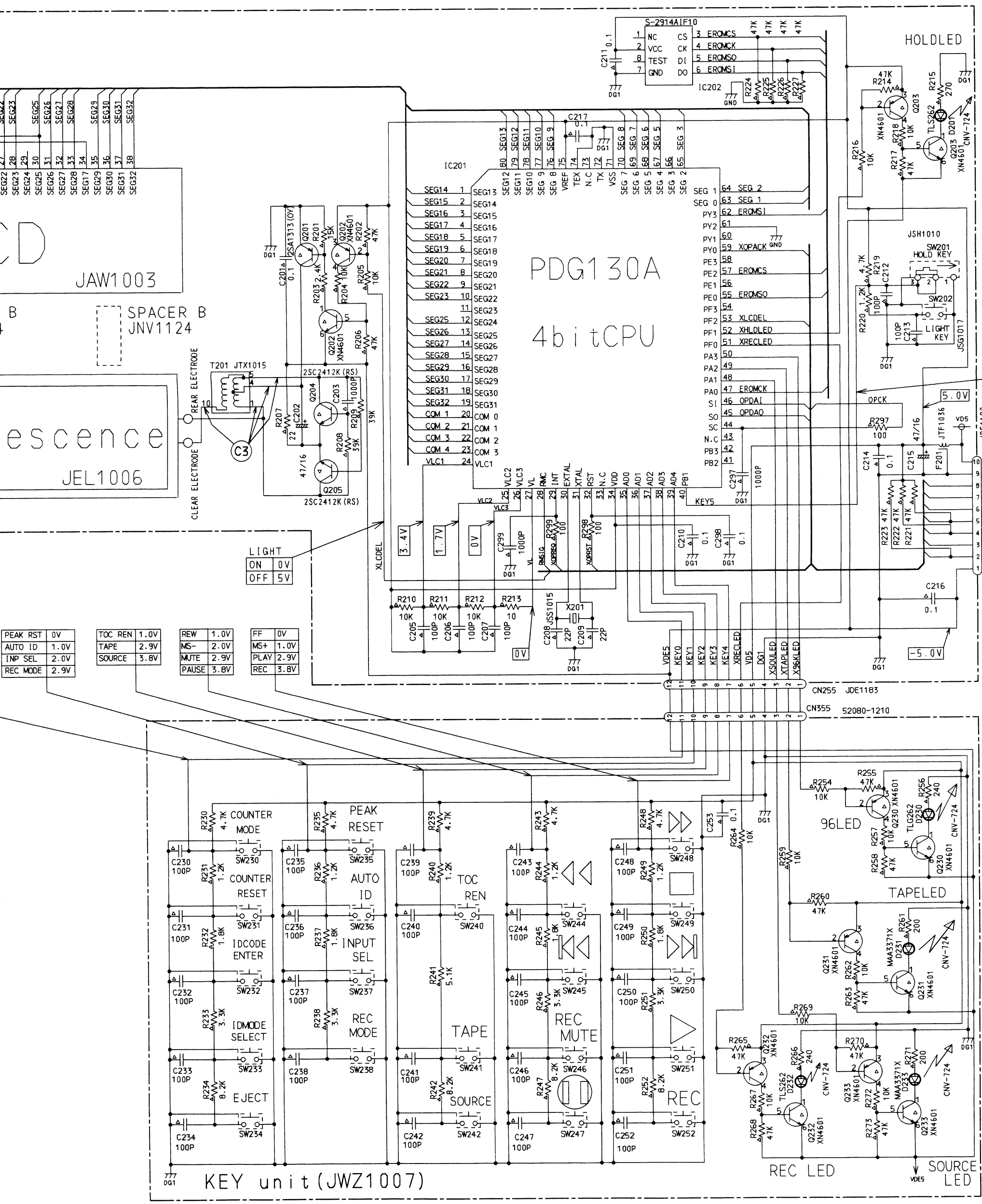
① INV IN1 (T201－Pin5)
Signal 0V (EL OFF－5V)
② INV IN2 (T201－Pin4)
10V/div.,0.5mS/div.
③ INV OUT1 (T201－Pin1)
10V/div.,0.5mS/div.
④ INV OUT2 (T201－Pin10)
50V/div.,0.5mS/div.

REM.RECEIVER unit (JWZ100)



SCH－5 LINE/MIC UNIT、DISPLAY UNIT、KEY UNIT、REM RECEIVER UNIT、HEADPHONE UNIT

SCH-5

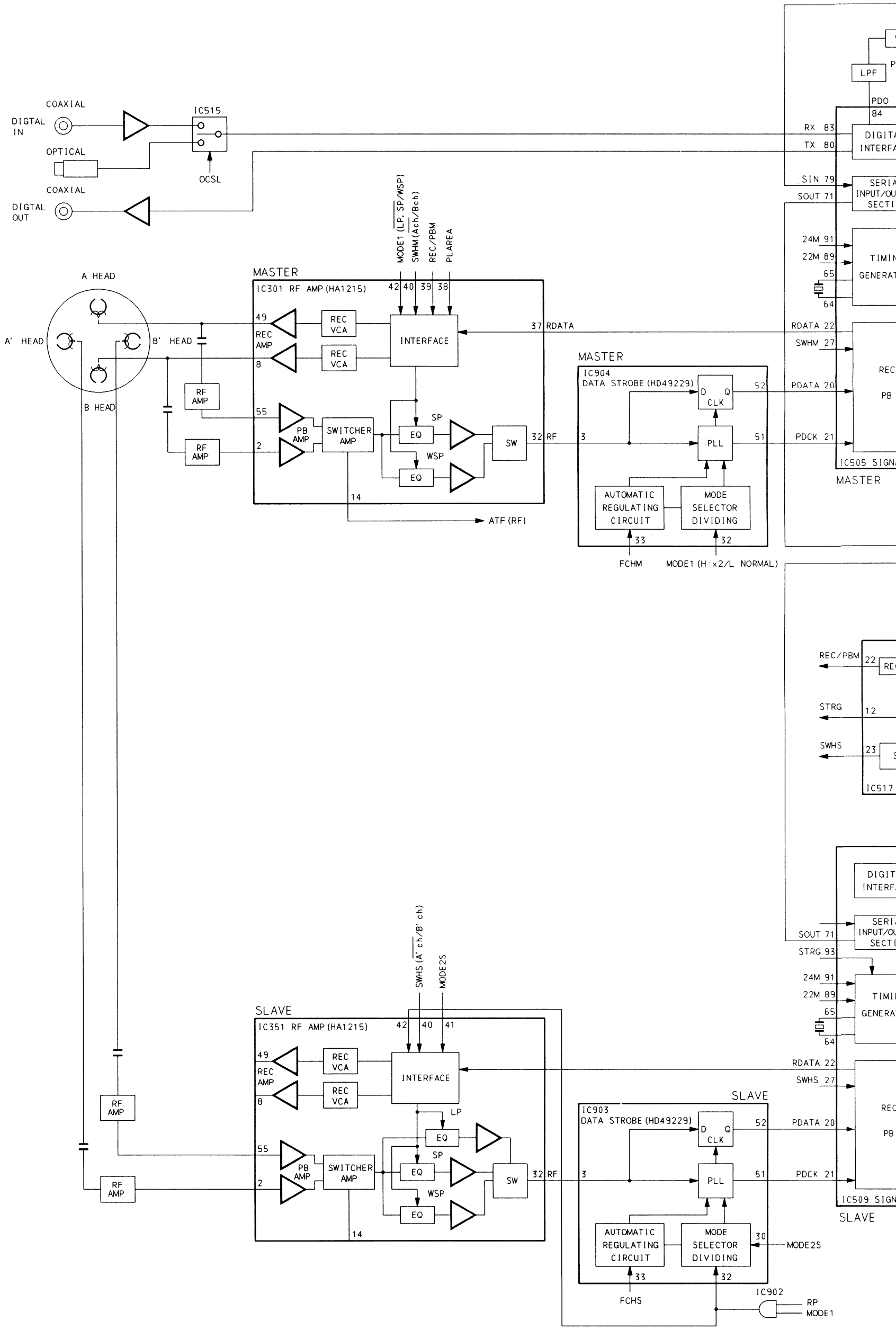


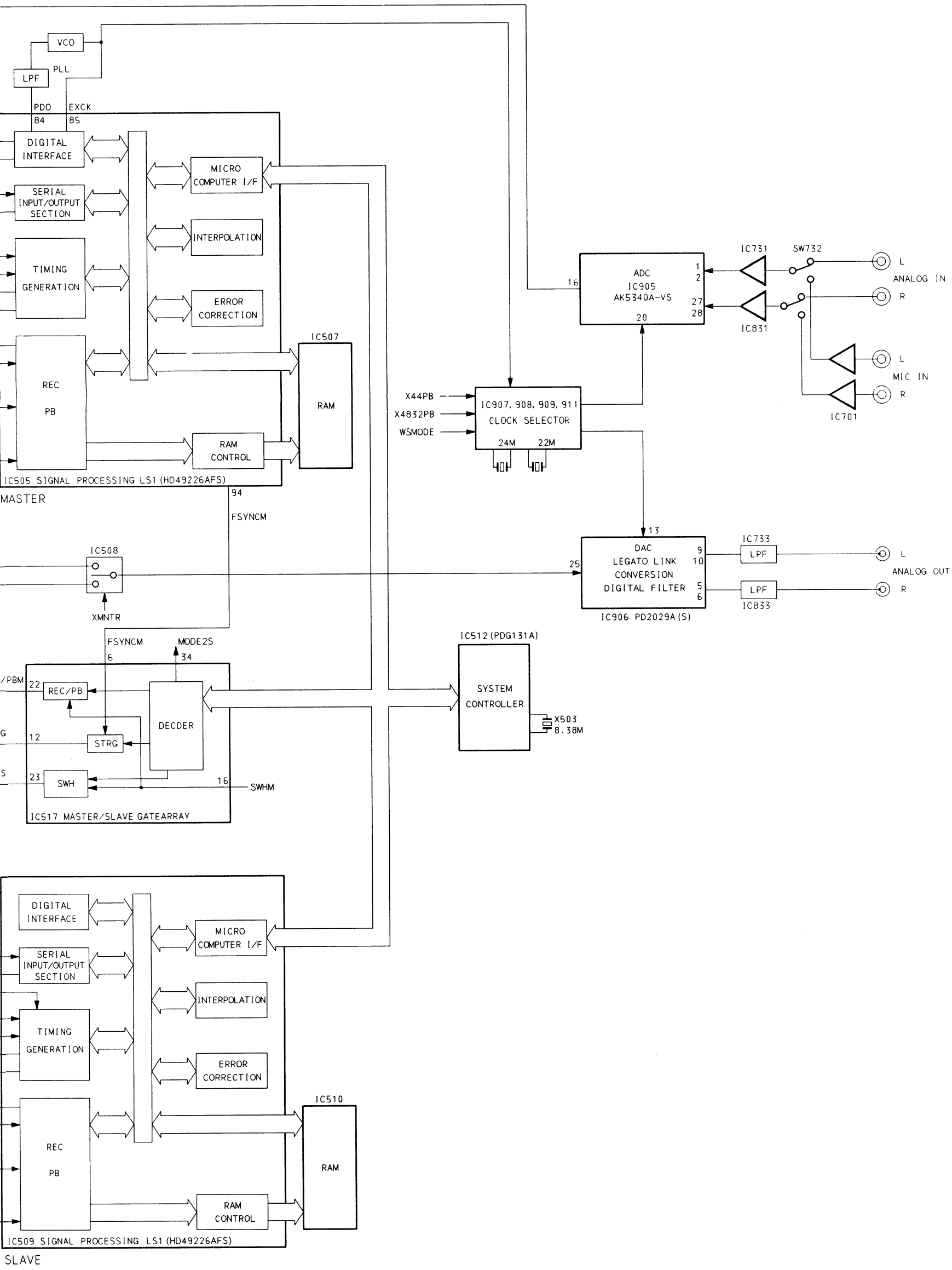
LINE/MIC UNIT、DISPLAY UNIT、
KEY UNIT、REM RECEIVER UNIT、
HEADPHONE UNIT

SCH-5

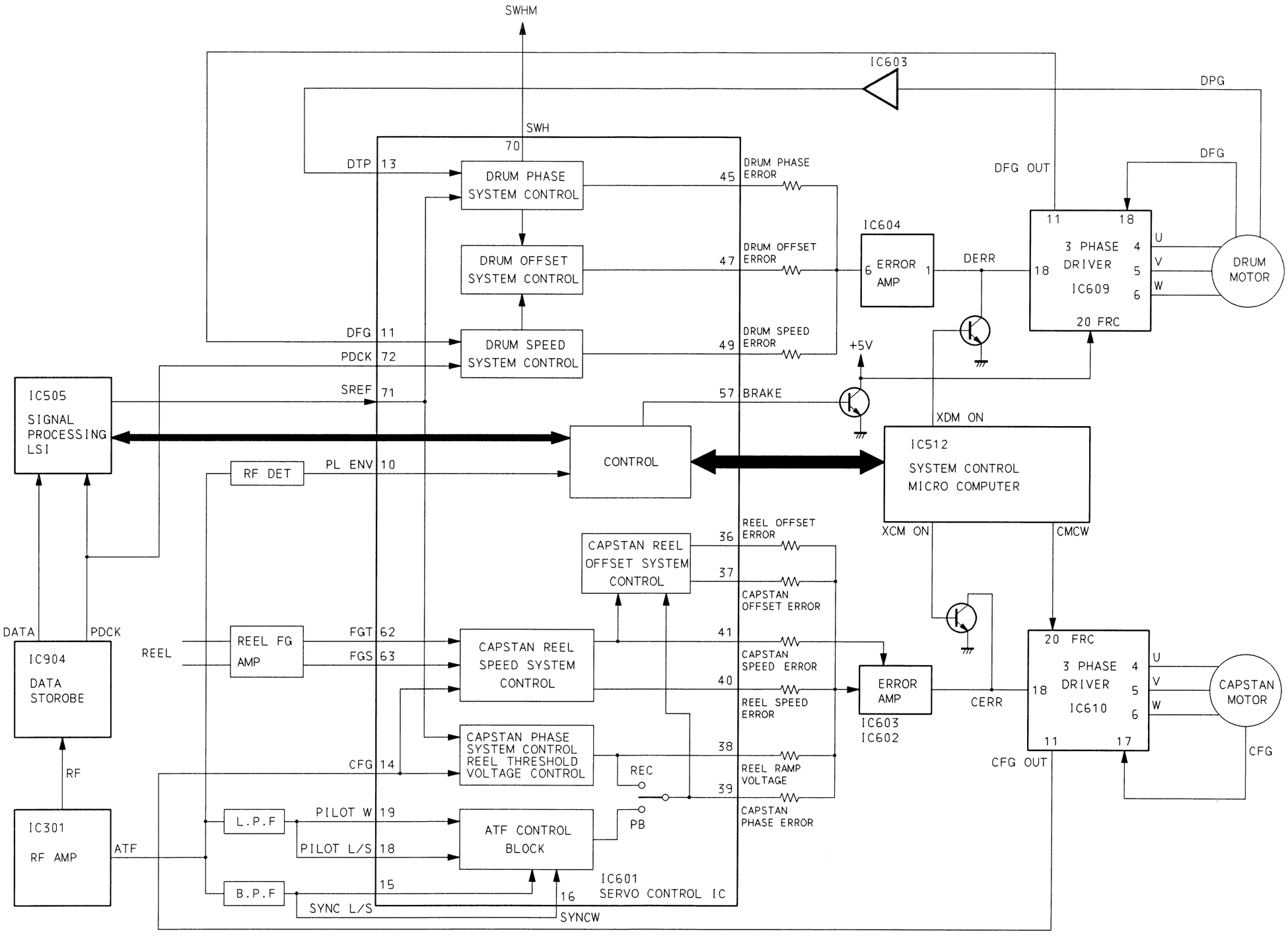
2.3 BLOCK DIAGRAM

1. SIGNAL PROCESSING SECTION




VCO
LPF
PLL
PDO
84
EXCK
85
DIGITAL INTERFACE
SERIAL INPUT/OUTPUT SECTION
TIMING GENERATION
REC PB
MICRO COMPUTER I/F
INTERPOLATION
ERROR CORRECTION
RAM CONTROL
IC507
RAM
IC505 SIGNAL PROCESSING LS1 (HD49226AFS)
MASTER
94
FSYNCM
IC508
XMNTR
FSYNCM
6
MODE2S
34
/PBM
22
REC/PB
12
STRG
23
SWH
16
SWHM
DECDER
IC517 MASTER/SLAVE GATEARRAY
16
ADC
IC905
AK5340A-VS
20
1
2
27
28
IC731
IC831
SW732
L
ANALOG IN
R
L
MIC IN
R
IC701
X44PB
X4832PB
WSMODE
IC907, 908, 909, 911
CLOCK SELECTOR
24M
22M
13
25
DAC
LEGATO LINK
CONVERSION
DIGITAL FILTER
9
10
5
6
IC733
LPF
IC833
LPF
L
ANALOG OUT
R
IC906 PD2029A(S)
IC512(PDG131A)
SYSTEM CONTROLLER
X503
8.38M
DIGITAL INTERFACE
SERIAL INPUT/OUTPUT SECTION
TIMING GENERATION
REC PB
MICRO COMPUTER I/F
INTERPOLATION
ERROR CORRECTION
RAM CONTROL
IC510
RAM
IC509 SIGNAL PROCESSING LS1 (HD49226AFS)
SLAVE

2. SERVO SECTION



3. SYSTEM CONTROL SECTION